

## VU Research Portal

### Exploring the socio-political dimensions of climate change mitigation - Analysis of post-2012 perceptions of China, India, South Africa, Brazil, Russia, Mexico and the United States

van Asselt, H.D.; Berghuis, J.H.; Biermann, F.; Cornelisse, C.; Haug, C.C.; Gupta, J.; Massey, E.E.

2008

#### **document version**

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

#### **citation for published version (APA)**

van Asselt, H. D., Berghuis, J. H., Biermann, F., Cornelisse, C., Haug, C. C., Gupta, J., & Massey, E. E. (2008). *Exploring the socio-political dimensions of climate change mitigation - Analysis of post-2012 perceptions of China, India, South Africa, Brazil, Russia, Mexico and the United States*. (IVM Report; No. W-08/18). Instituut voor Milieuvraagstukken, Vrije Universiteit.

#### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

#### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

#### **E-mail address:**

[vuresearchportal.ub@vu.nl](mailto:vuresearchportal.ub@vu.nl)

# **Exploring the Socio-Political Dimensions of Climate Change Mitigation**

**Analysis of post-2012 perceptions of China, India, South Africa,  
Brazil, Russia, Mexico and the United States**

Harro van Asselt, Jonathan Berghuis, Frank Biermann, Corinne Cornelisse,  
Constanze Haug, Joyeeta Gupta and Eric Massey

Report W-08/18

July 31, 2008

This report was commissioned by: The Netherlands Environmental Assessment Agency (PBL)

It was internally reviewed by: Frans Berkhout

#### IVM

Institute for Environmental Studies

Vrije Universiteit

De Boelelaan 1087

1081 HV Amsterdam

The Netherlands

Tel. ++31-20-5989 555

Fax. ++31-20-5989 553

E-mail: [info@ivm.falw.vu.nl](mailto:info@ivm.falw.vu.nl)

#### **Copyright © 2008, Institute for Environmental Studies**

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior written permission of the copyright holder.

## Contents

Contents	iii
Executive Summary	1
1. Introduction	3
1.1 Background	3
1.2 Objective of this report	3
1.3 Methodology	4
1.4 Limits and scope	4
1.5 Structure of the report	5
2. Policy Perception Framework	7
2.1 Perception of justice and equity	7
2.2 Perception of opportunity	7
2.3 Perception of affectedness	8
3. Post-2012 Negotiations	9
4. China in the Post-2012 Negotiations	11
4.1 Introduction	11
4.2 Country profile of China	11
4.3 Affectedness: Physical and social vulnerability	14
4.4 Institutional context	15
4.5 Justice and Equity: Framing of the problem	16
4.6 Opportunities in addressing climate change	17
4.7 Negotiation positions and strategies	17
4.8 Summary	18
5. India in the Post-2012 Negotiations	21
5.1 Introduction	21
5.2 Country profile of India	21
5.3 Affectedness: Physical and social vulnerability	25
5.4 Institutional context	25
5.5 Justice and Equity: Framing of the problem	28
5.6 Opportunities in addressing climate change	29
5.7 Negotiating positions and strategies	29
5.8 Summary	30
6. South Africa in the Post-2012 Negotiations	33
6.1 Introduction	33
6.2 Country profile of South Africa	33
6.3 Affectedness: Physical and social vulnerability	36
6.4 Institutional context	37
6.5 Justice and Equity: Framing of the problem	38

6.6 Opportunities in addressing climate change	39
6.7 Negotiation positions and strategies	41
6.8 Summary	42
7. Brazil in the Post-2012 Negotiations	45
7.1 Introduction	45
7.2 Country profile of Brazil	45
7.3 Affectedness: Physical and social vulnerability	48
7.4 Institutional context	49
7.5 Justice and Equity: Framing of the problem	51
7.6 Opportunities in addressing climate change	52
7.7 Negotiation positions and strategies	53
7.8 Summary	55
8. The Russian Federation in the Post-2012 Negotiations	57
8.1 Introduction	57
8.2 Country profile of the Russian Federation	57
8.3 Affectedness: Physical and social vulnerability	61
8.4 Institutional context	62
8.5 Justice and Equity: Framing of the problem	63
8.6 Opportunities in climate change mitigation	63
8.7 Negotiating positions and strategies	63
8.8 Summary	64
9. Mexico in the Post-2012 Negotiations	67
9.1 Introduction	67
9.2 Country profile of Mexico	67
9.3 Affectedness: Physical and social vulnerability	70
9.4 Institutional context	71
9.5 Justice and Equity: Framing of the problem	74
9.6 Opportunities in addressing climate change	74
9.7 Negotiation positions and strategies	76
9.8 Summary	77
10. United States in the Post-2012 Negotiations	79
10.1 Introduction	79
10.2 Framing of the problem	79
10.3 Institutional context	80
10.4 Physical and social vulnerability	81
10.5 Negotiation position	83
10.6 Discussion of perceptions	83
11. Conclusions	89
11.1 Reiteration of research goals	89
11.2 Conclusions	89
11.3 Further research	91
References	95





## Executive Summary

The European Union and in particular the Netherlands Environmental Assessment Agency (PBL) believe that in order to effectively mitigate the dangers of climate change, atmospheric greenhouse gas concentrations must be stabilized at 450 ppm CO<sub>2</sub> equivalent by 2050. It is assumed that this can only be achieved through a unified global effort that involves binding – even though differentiated – targets and commitments from all major nations. To that end the EU and PBL advocate that the most environmentally effective agreement is in the form of a ‘grand coalition’. Reaching this type of agreement, however, has so far been difficult. Countries remain locked into their negotiating positions, making the prospect of a ‘grand coalition’ agreement tenuous. These negotiating positions are largely based on how countries politically perceive the issue of climate change, for example as a threat or as an opportunity. These perceptions are rooted in the social, political and economic circumstances of a country. Thus, if one can better understand what drives these perceptions, certain ‘leverage points’ could be identified that help appeal to the social and economic interests of a country and shift their political will towards accepting a multi-stage, ‘grand coalition’ agreement.

This report takes the first step in attempting to identify these leverage points by building profiles of the major countries involved in the post-2012 debate: China, India, South Africa, Brazil, Russia, Mexico, and the United States. In these profiles we explore how each country perceives the three dominant socio-political factors that have underscored the climate negotiations since their inception:

1. *Justice and equity*—most countries perceive taking action on climate change as fundamentally rooted in issues of equity and will not take action unless their equity concerns are addressed;
2. *Opportunity*—countries may see climate change as not only a problem, but also as an opportunity to fulfil their own social and economic interests by agreeing to take action in return for resources from other countries;
3. *Affectedness*—while some countries perceive climate change as a real and present threat to their own and others’ livelihoods and institutions and believe that it calls for a negotiated solution and immediate policy intervention, others are sceptical of how they will be affected and see only a limited value in negotiations and policy interventions.

Below we briefly summarize some of the findings that have emerged from our profiles on these issues.

### Affectedness

Perceptions of affectedness appear to be important in all of our case countries with the exception of Russia. Interestingly, however, affectedness is addressed differently, with some countries focussing on environmental affectedness (such as Mexico) and others defining affectedness stronger in economic terms (such as the United States). For others, the science of understanding climate vulnerabilities is limited or research is just beginning, putting them in the position of greater uncertainty. Thus perceptions are not neces-



sarily derived from their own experience. In this case we may think especially of India and to some degree China.

### Justice and equity

The perception of justice and equity is probably the most straightforward perception to emerge from our country profiles. Three aggregate issues can be distilled to help elucidate this perception: issues of sovereignty, as with the case of Brazil and their reluctance to involve issues of the Amazon in the negotiations; issues of economic protection and gain, as is the case with Mexico's oil industry or China's (and to some degree India's) rapidly growing economy; and issues of scientific uncertainty of how vulnerable a country is to climate change. These issues then feed the perceptions that each actor is in some degree being asked to do more than they perceive is fair or just.

### Opportunity

Unlike the perceptions of affectedness and justice and equity, the perception of opportunity is perhaps the most difficult to generalize across countries. While it can be stated that for the majority of countries, perceptions of opportunity revolve around opportunities of financial or material gain, the perception on how these gains would be achieved varies. Moreover, beyond material gain there is the implicit (and sometimes explicit) expression of political opportunity to be realized within negotiations. This enhancement of political opportunity naturally feeds into the capitalization on material opportunity. China, for example, portrays itself as a 'leader' of the G77 and to that end attempts frequently to set the negotiation agenda with what it (and others) see as the most salient issues; technology transfer being most prominent. Brazil also takes on the mantle of 'leader' of South America, given its size and economy.

# 1. Introduction

## 1.1 Background

While the 2007 Conference of Parties meeting in Bali, Indonesia and the ensuing ‘Bali Roadmap’ were a successful first step in the formal negotiating process on a post-2012 climate agreement (by defining four key building blocks of the future climate regime), speculation remains on what any new agreement might look like and how it will be achieved. The European Union and in particular the Netherlands Environmental Assessment Agency believe that in order to effectively mitigate the dangers of climate change, greenhouse gas concentrations must be stabilized at 450 ppm CO<sub>2</sub> equivalent by 2050. This, however, can only be achieved through a unified global effort that involves binding – even though differentiated – targets and commitments from all major countries (see also MNP, 2006). To that end they are advocating that the most environmentally effective agreement is in the form of a ‘grand coalition’ built upon the so-called multi-stage approach whereby all countries over time take on ever increasing mitigation commitments based on national circumstances and economic development.

Much research has been undertaken by PBL to highlight the theoretical effectiveness and flexibility of this approach as compared to other existing post-2012 proposals as well as detailing the greenhouse gas mitigation commitments required. Nevertheless, questions remain as to whether countries will be politically willing to make those commitments. We know from international relations theory that it is almost impossible to force a country into an international agreement as countries do not act out of altruism, but that such agreements need to be compatible with their social and economic interests. Furthermore, there needs to be political will and perhaps, in the case of climate change, a certain degree of scientific certainty before accepting international commitments. Thus despite the success in Bali, countries still remain entrenched in their negotiating positions, making the prospect of a grand coalition agreement doubtful. These negotiating positions are largely based on how countries politically perceive the issue of climate change, for example as a threat or as an opportunity. These perceptions are rooted in the social, political and economic circumstances of a country. If we can better understand what drives these perceptions (vis-à-vis climate change), there is the possibility that certain ‘leverage points’ could be identified for individual countries that could help appeal to their social and economic interests and thereby help shift their political will towards accepting a multi-stage, grand coalition agreement.

## 1.2 Objective of this report

In this initial report we attempt to create profiles of the dominant socio-political (and to some degree economic) issues and factors that drive the climate change negotiating/policy positions of the most dominant countries involved in the post-2012 debate: Brazil, China, India, Mexico, Russia, South Africa and the United States. We hope that at a later stage these profiles will serve to inform possible leverage points for future negotiations.

### 1.3 Methodology

The country profiles are presented in two main parts and are constructed as follows. In the opening sections we attempt to first highlight the important socio-economic indicators that define and characterize a country with respect to the issue of climate change mitigation. These include, *inter alia*, GDP, total primary energy supply, and CO<sub>2</sub> emissions. Second, we outline the domestic and international institutional aspects that relate to climate change, including domestic policies and international commitments. Third, we attempt to detail the physical as well social vulnerabilities of the country to current and projected climate change, show how the countries outwardly frame the issue of climate change, and detail potential opportunities that undertaking climate change mitigation efforts might offer. We also attempt to offer an objective view of the countries' negotiating strategies and positions within the framework of the United Nations Framework Convention on Climate Change (UNFCCC).

The concluding part of the profiles takes a more subjective view where we try to interpret the empirical socio-political and economic facts through the lens of how we believe the country interprets or perceives those facts. In this way we are looking for the gaps in what the physical and social 'reality' is and what the countries' impressions are. We have done this by creating a policy perception framework (detailed below) that covers the three dominant socio-political issues that underpin the negotiation on climate change:

1. *The perception of justice and equity*—countries perceive taking action on climate change as fundamentally rooted in issues of equity and will not take action unless their issues of equity are addressed;
2. *The perception of opportunity*—countries may see climate change as not only a problem, but also as an opportunity to fulfil their own social and economic interests by agreeing to take action in return for resources from other countries;
3. *The perception of affectedness*—countries perceive climate change as a real and present threat to their own and others' livelihoods and institutions and believe that it calls for a negotiated solution and immediate policy intervention. Conversely, other countries are sceptical of how they will be affected and see only a limited value in negotiations and policy interventions.

All of the countries profiled in this report follow this schematic save for the United States. In the case of the US, because of their pivotal, polarizing and well-publicized role within the climate debate, we have sought to take a more discursive approach from the outset preferring to focus more on their perceptions.

### 1.4 Limits and scope

It should be noted that while we attempt to give an overall picture of climate related activities in our case countries, we focus primarily on mitigation. To be sure, adaptation to climate change is an important issue within countries and the UNFCCC negotiations, especially the discussion of adaptation funding. We nevertheless feel that an investigation of the socio-political dimensions surrounding adaptation would require a separate study. Secondly, any investigation of negotiating positions would ideally require in depth interviews of country negotiators and government officials. Where possible this had been

done though much of the information is derived from first and secondary literature in the English language.

### 1.5 Structure of the report

Overall the report is structured as follows. Following the introduction we outline in more detail the policy perception framework further defining what is to be understood from the concepts of equity, opportunity and affectedness (Chapter 2). We then outline in brief the evolution and current state of the post-2012 international negotiations under the UNFCCC from the 11<sup>th</sup> Conference of the Parties in Montreal until the conference in Bali (Chapter 3). This discussion is followed by our country profiles (Chapters 4-10). The report concludes with a cross comparison of the perceptions of each country as well as recommendations for future research (Chapter 11).



## 2. Policy Perception Framework

How a country perceives the issue of climate change and its ensuing international discussions shapes how that country has and will continue to act within the negotiations on a post-2012 climate regime. The three dominant socio-political issues that have emerged in this study thus far appear to revolve around issues of justice and equity, opportunity, and affectedness. Understanding how a country perceives these issues will help to elucidate, in future, possible points of political leverage to further a grand coalition agreement.

### 2.1 Perception of justice and equity

For large developing countries, issues of justice and equity have long been at the core of the climate debate relating to issues of historical liability and the polluter pays principle. We see the issue as two-fold: the socio-economic concerns more narrowly related to climate change mitigation, and deep-seated issues more broadly related to the social and political history of a country.

**Direct socio-economic concerns:** Many countries are reluctant to undertake mitigation efforts; especially developing countries as they see what is being asked of them is unfair. Or they are reluctant because they see unilateral mitigation efforts as leading to lower competitiveness in the international market. We try to thus identify the core issues for each country in this category, exploring what they see in the current status of the negotiations as inequitable.

**Broader deep-seated concerns:** Issues of justice and equity are not always related purely to narrow negotiation issues. Generally, there are other underlying factors that contribute to a country's perception that the negotiations are inequitable, based perhaps on their social history in relation to other countries. This may be particularly so for countries that were formerly colonies or that had a divisive social history. We attempt, where applicable, to highlight these issues.

### 2.2 Perception of opportunity

Many countries are opportunistic when it comes to the climate change debates. In this instance we try to pinpoint and highlight the issues or areas where each country thinks it can benefit in terms of 1) improving its own economic and political position owing to specific mechanisms of climate policy; and 2) improving its own economic and political position in areas outside climate governance.

**Opportunities for a country to benefit within climate policy:** Here one may think primarily of technology transfer that will help a country in its mitigation efforts or the creation of markets that will help sell its technologies.

**Opportunities outside climate policy:** The climate negotiations have become a forum for countries to negotiate on a multitude of issues that fall outside climate policy and governance (i.e. mitigation of greenhouse gas emissions and adaptation), with some countries posturing that if they were to receive  $x$ ,  $y$  and  $z$  they would be more amenable

to taking on more stringent climate policies. These include: better trade relations, the removal of agricultural subsidies, the easing of intellectual property rights, non-climate related technology transfer, as well as larger political-strategic considerations, for example the desire to be perceived as a major power that takes on 'global responsibilities', or the desire to please certain other countries that are of strategic importance.

### 2.3 Perception of affectedness

The perception of affectedness revolves around how and to what degree a country perceives that it, and others, will be affected by climate change, both in terms of environmental changes and in terms of political or economic harm (which can include harm from mitigation policies as well as harm from climate change). Determining these factors can help gauge the degree to which a country will take on climate policies. The rationale is that if a country does not believe it will be affected the less it will do; or the more that the other perceptions of equity and opportunity come into play. For example, one could posit that the US does not have a high perception of affectedness (being rather sceptical), thus to get this country to engage in negotiations and implement climate policies within a grand bargain, the EU would need to appeal more to their perception of opportunity and/or equity. We thus look at two factors:

**Climate affectedness:** To what degree do countries believe they or others will be affected? Is this a major concern for them? Moreover, how is climate affecting a country's perception of external justice, in the sense that they might be the cause of an environmental crisis?

**Political affectedness:** How and to what degree is climate change affecting the political institutions in a particular country, if at all?

In the following chapter we discuss in brief the evolution and current state of the post-2012 international negotiations under the UNFCCC from the 11<sup>th</sup> Conference of the Parties in Montreal until the conference in Bali.

### 3. Post-2012 Negotiations

With the Kyoto Protocol's rulebook largely in place and implementation having started in most countries, the question of how to continue beyond Kyoto's commitment period has become a key issue in current international debate.

At the eleventh Conference of the Parties (COP-11) to the UNFCCC, serving as the first Meeting of the Parties (COP/MOP-1) to the Kyoto Protocol, held in Montréal in December 2005, a first set of small steps was made to discuss and negotiate the future of international climate governance through the UNFCCC (see, e.g. Bausch & Mehling, 2006; Schipper & Boyd, 2006). First, in the context of the UNFCCC, an agreement to start an open, non-binding dialogue was reached (UNFCCC, 2006a). Second, discussions on new commitments for developed countries were initiated on the basis of Article 3.9 of the Kyoto Protocol. In Montréal, it became visible that developing countries still vigorously opposed discussing the possibility of commitments, when some parties, including the European Union, Canada, and Japan, attempted to broaden the discussion of new commitments for Annex I countries to a review of the Kyoto Protocol (which was due for the second COP/MOP). Eventually, the parties agreed to establish an Ad Hoc Working Group (AWG) to address the issue of future commitments for Annex I Parties (UNFCCC, 2006b).

The issue of future commitments was once again on the agenda at COP-12 and COP/MOP-2, held in Nairobi in November 2006. A decision was taken there to hold the review in the context of Article 9 at the fourth COP/MOP in 2008, but that this review "shall not lead to new commitments for any Party" (UNFCCC, 2006c). The Nairobi talks can be seen then as merely a prelude to the discussions at the following COP and COP/MOP in Bali, Indonesia in December 2007. The Bali meeting was significant as it presented a crucial moment in the UNFCCC process to set in motion negotiations on a follow-up agreement to be concluded before the expiration of the current Kyoto targets.

Following intense negotiations, parties to the UNFCCC finally adopted a series of decisions together referred to as the "Bali Road Map" (see, for example, Cléménçon, 2008). The key decision of COP-13 is known as the Bali Action Plan (UNFCCC, 2008a). The decision launches "a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision at its fifteenth session". The negotiation process takes place within the Ad Hoc Working Group on Long-term, Cooperative Action, which will meet more frequently than the COP. The decision avoids any explicit reference to a quantitative elaboration of a long-term objective and does not go further than calling for "deep cuts", referring via a footnote to specific pages in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). It also does not indicate specific ranges for short- to medium term targets. Furthermore, the decision leaves open a wide range of possibilities on how a post-2012 treaty might look, and does not clarify whether such an agreement will include binding emission reductions for developing countries. Although there was considerable pressure on developing countries to adopt "measurable, reportable and verifiable nationally appropriate mitigation actions", the developing countries were ultimately able to



renegotiate the text such that the term “measurable, reportable and verifiable” is now used more in connection with technology financing and capacity building to be provided to developing countries to enable them to implement their obligations (Cléménçon, 2008).

With respect to the Kyoto Protocol, another important document emerging from the Bali meeting is the outcome of discussions under the Ad Hoc Working Group established in Montréal (UNFCCC, 2008b). Unlike the Bali Action Plan, the AWG report does provide an indication of possible ranges for short- to medium targets, stating that achieving low greenhouse gas stabilization levels as indicated by the IPCC “would require Annex I Parties as a group to reduce emissions in a range of 25–40 per cent below 1990 levels by 2020”.

The Bali Road Map and AWG report provide two tracks on the way to a post-2012 agreement; one with the United States and one without. It is unclear whether the two processes will merge or how they will interact, however it would appear that the parties wish to keep all options open at present.

## 4. China in the Post-2012 Negotiations

### 4.1 Introduction

Engaging China in the international negotiations on climate change is increasingly important for two reasons: First, China is already the second highest consumer of energy and second largest emitter of greenhouse gases (GHGs) (Paredis *et al.*, 2006). Its emissions are increasing steadily, and it is surmised that China may have already surpassed the emissions of the United States in 2006 (MNP, 2007). Second, as the world's largest developing country, China has a prominent voice in the United Nations and plays a leading role within the G77 bloc in the UN climate negotiations (Heggelund, 2007).

Despite China's importance, its role as an international actor in climate negotiations is not easily characterized. While China ratified the UNFCCC in 1993 and the Kyoto Protocol 2002, in 2005 they joined the US-led Asia-Pacific Partnership (APP) (Van Asselt, 2007). However, a closer examination of China's environmental policies also reveals challenges in reducing its emissions growth rate (Jeon & Yoon, 2006).

In this chapter we will investigate the role of China in the recent post-2012 negotiations. The focus will be on the differences and similarities between the actual and perceived affectedness, equity and opportunity. In order to investigate this we first provide a country profile with the help of key socio-economic indicators, and indicators related to energy and environment. Second, we assess the actual affectedness, the domestic framing of the issue and the actual opportunities for climate change mitigation. Third, we give an overview of the institutional context, that is, the country's international and domestic commitments on climate change and energy. Fourth, we examine the recent negotiation strategies and positions of China. Finally we summarize the similarities and differences between the country's actual and perceived affectedness, equity and opportunity.

### 4.2 Country profile of China

#### 4.2.1 Socio-economic profile

The main drivers behind China's increasing greenhouse gas emissions can be attributed to four factors; rapid industrialization, economic growth, increasing urbanization and population growth (Paredis *et al.*, 2006). These socio-economic trends are summarized in table 4.1. China is officially recognized as a developing country with a per capita GDP of US\$ 1,713 or US\$ 6,757 PPP and a medium ranking of 81 on the human development index; 34.9% of the population lives on less than US\$ 2 a day. However, if compared to three decades ago, when China had a strictly planned economy, the progress made since then is astounding. The program of economic restructuring and liberalization set in motion in 1979 has achieved rapid economic growth and improvements in living standards. The annual GDP growth rate in the period 1975-2005 was 8.4%, with growth levels increasing even more in recent years. In comparison to 1990, the imports and exports of goods and services as a percentage of GDP increased from 16% to 32% and 19% to 37% respectively. The population has grown at a rate of 1.2% in the period 1975-2005, but is

projected to decrease by 0.6% towards 2015. An increasing part of the population lives in cities where urban population has risen from 17.4% in 1975 to 40.4% in 2005 and is projected to approach half of the population (49.2%) by 2015.

*Table 4.1 Overview of selected socio-economic indicators for China (Source: UNDP, 2007).*

Population 2005 (millions) *1	1,313.0
Annual population growth rate *1	1.2 (1975-2005)
	0.6 (2005-2015) *2
Urban population (% of total) *5	17.4% (1975)
	40.4% (2005)
	49.2% (2015) *2
GDP 2005	2,234.3 (US\$ billions)
	8,814.9 (PPP US\$ billions)
GDP per capita 2005	1,713 (US\$)
	6,757 (PPP US\$) *3
GDP growth rate (%)	8.4% (1975-2005)
	8.8% (1990-2005)
Human development index 2005 (# and ranking)	0.777 (ranked 81, medium human development)
Population below 2 USD and 1 USD a day 1990-2005 (%) *4	34.9% (below 2 US\$ a day)
	9.9% (below 1 US\$ a day)
Imports of goods and services (% of GDP)	32% (2005)
	16% (1990)
Exports of goods and services (% of GDP)	37% (2005)
	19% (1990)
Net FDI inflows (% of GDP 2005)	3.5% (2005)
	1.0% (1990)

\*1 Population estimates include Taiwan Province of China.

\*2 Data refer to medium-variant projections.

\*3 World Bank estimate based on a bilateral comparison between China and the United States (Ruoan and Kai, 1995).

\*4 Data refer to the most recent year available during the period specified.

\*5 Because data are based on national definitions of what constitutes a city or metropolitan area, cross-country comparisons should be made with caution.

#### 4.2.2 Energy and environment profile

The above socio-economic trends have contributed to one of the greatest carbon footprints in the world. Looking at the total emission, China is the second highest consumer of energy and second largest emitter of GHGs. The United Nations Development Programme projects that China will become the largest GHG emitter within this decade. Figure 4.1 depicts the projection of the emissions without mitigation.

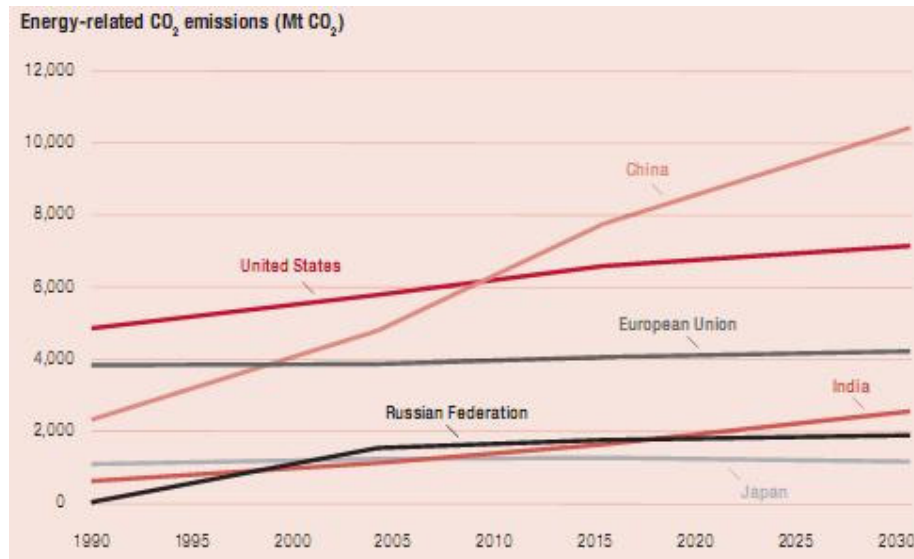


Figure 4.1 Business-as-usual CO<sub>2</sub> emissions on a rising trend (Source: IEA, 2006 in UNDP, 2007: 56).

On a per capita basis, however, the Chinese emission of GHGs remains low when compared to developed countries (China = 3.8; OECD = 11.5; US = 20.6 t CO<sub>2</sub> p.c.). However, while China is getting wealthier the electricity consumption per capita is increasing rapidly with already a 212.4% change in the period 1990-2004. Currently, CO<sub>2</sub> emissions are increasing annually with 7.8%.

Table 4.2 Overview of selected energy and environment indicators for China (Source: UNDP, 2007).

Electricity consumption per capita in kWh	1,684 (2004)
	212.4 (% change 1990-2004)
Total primary energy supply (TPES) 2005 (Mt of oil equivalent) *1	1,717.2 (2005)
	863.2 (1990)
CO <sub>2</sub> emissions 2004 (Mt CO <sub>2</sub> )	5,007.1 (2004)
	2,398.9 (1990)
	7.8% annual change
CO <sub>2</sub> per capita (t CO <sub>2</sub> )	3.8 (2004)
	2.1 (1990)
% of world total	17.3% (2004)
	10.6% (1990)

\*1 Total primary energy supply (TPES) is made up of 'indigenous production + imports – exports - international marine bunkers ± stock changes'. TPES is a measure of commercial energy consumption. In some instances, the sum of the shares by energy source may not sum up to 100% because pumped storage generation has not been deducted from hydroelectricity generation.

In addition to increased electricity consumption, China's strong dependence on coal (63% of TPES) is another factor that will contribute to future emissions (see Figure 4.2). The sectoral GHG emissions stem primarily from electricity generation, heating, manufacturing and industrial processes (see Figure 4.3). The transport sector, currently

responsible for only 6% of the GHG emission, will likely grow dramatically as cars become more affordable for the growing middle class.

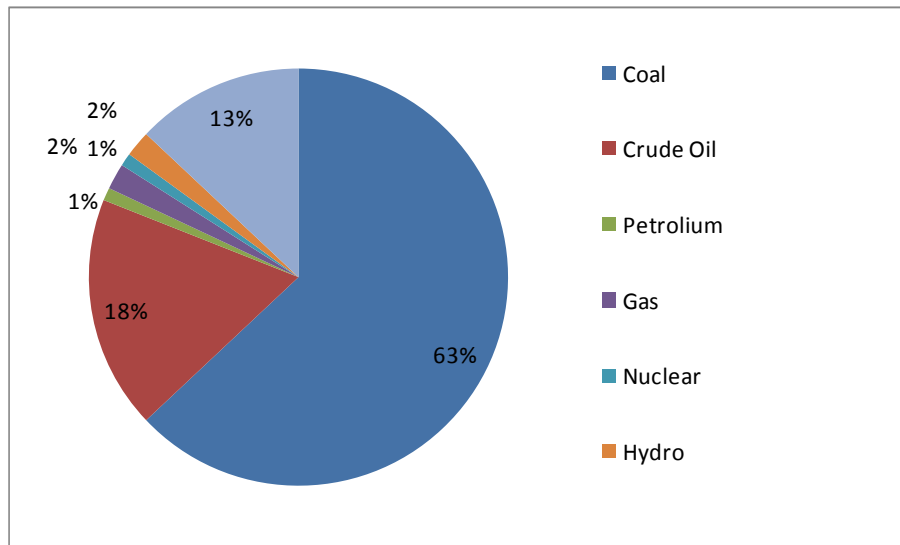


Figure 4.2 Chinese Total Primary Energy Supply (TPES) by source in 2005 (based on IEA, 2007).

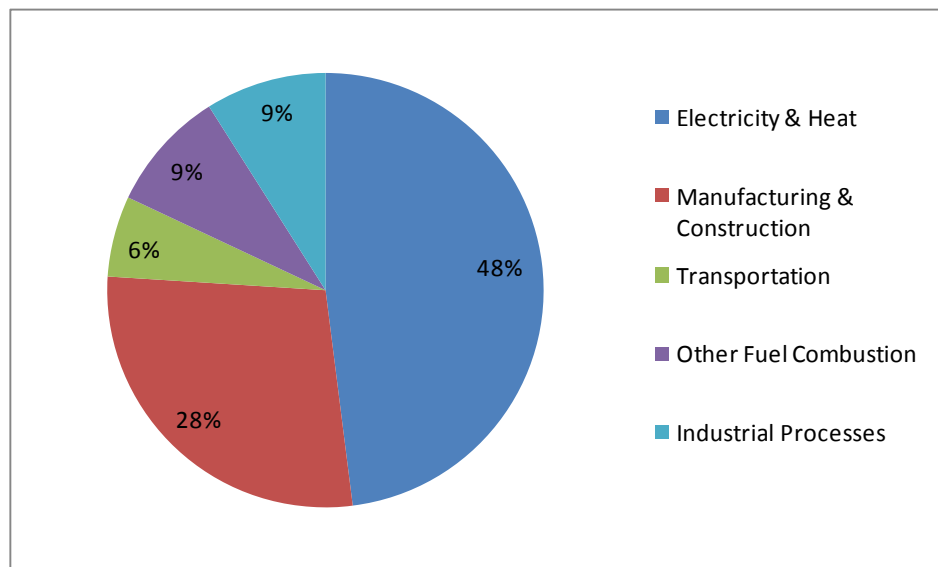


Figure 4.3 Chinese GHG emissions by sector in 2004 (excludes land use change) (based on WRI, 2008).

#### 4.3 Affectedness: Physical and social vulnerability

China can be characterized as highly vulnerable to climate change. In late 2006, the Chinese government released the first 'National Assessment Report on Climate Change' developed under the auspices of 20 governmental departments (Erda *et al.*, 2007). The study on the impacts focuses in particular on four areas: agriculture, terrestrial ecosystems, water resources, and coastal zones.

First, in terms of agriculture, climate change would greatly influence China's agricultural output. Already by 2030, the overall crop productivity could decrease by 5-10%. The water demand would grow in most regions of the country because of the increased evaporation. Second, in terms of terrestrial ecosystems, the productivity of forests would probably not decrease although the structure and composition of forests in northern China would change greatly. In semi-arid areas desertification would gain momentum. Regional warm weather and sea-level rise would lead to reduced wetland area, biodiversity loss and increasing number of endangered species. In the next 50 years the areas of surface permafrost in the Tibetan Plateau could be reduced by 10-15%. Climate change would also accelerate the shrinking of inland lakes. Third, in terms of water resources, climate change could decrease river runoff in northern China and increase in southern China. The probability of droughts and floods would decrease, destabilizing water resource distribution. The total area of China's western glaciers is projected to decrease by 27.2%. Fourth, the rise in sea-level (by 0.01-0.16 m in 2030) in densely populated coastal regions will spur disasters such as storm surges, droughts and extreme weather. Aside from these four main impact areas, climate change could also result in a higher mortality and morbidity due to the increase in serious diseases (Erda *et al.*, 2007).

#### 4.4 Institutional context

##### 4.4.1 Participation in international institutions

As stated above, China is an active party in the international negotiations on climate change and a leader in G77- China Group. Its statements at the Seminar of Government Experts (SoGE) and at the G8 Gleneagles Summit held in 2005 make clear that China is willing to play an active role in the post-2012 climate regime. China has entered into multilateral partnerships on climate change mitigation and energy efficiency (IGES, 2005) and was among the first to ratify the UNFCCC in 1993. It has shown a strong commitment to participate in the regime and to comply with international norms. In August 2002, it ratified the Kyoto Protocol. However, as a developing country China is not bound by quantitative emission reductions targets.

China has also entered into several bilateral partnerships. Four of these in particular are of note:

1. *The EU and China Partnership on Climate Change*. The objective of this partnership is "to develop and demonstrate, in China and the EU, advanced zero emissions coal technology; to significantly reduce the cost of key energy technologies and promote deployment and dissemination" (Paredis *et al.*, 2006);
2. *The Asia-Pacific Partnership for Clean Development and Climate*. The objective of this partnership is "to develop, deploy and transfer cleaner, more efficient technologies and to meet national pollution reduction, energy security and climate concerns" (Paredis *et al.*, 2006: 68);
3. *The US-China Working Group on Climate Change*. The objective of this partnership is the cooperative research and analysis on areas of non-CO<sub>2</sub> gases, economic/environmental monitoring, potential consequences of climate change, adaptation and technology;

4. *The Australia-China Climate Change Partnership.* Both parties entered into joint activities in the domains of climate change science, policies, impacts, adaptation, technology cooperation, capacity building, public awareness and energy efficiency.

To understand how the Chinese government has addressed the climate issue it is worth a brief look at the institutional structure surrounding climate change. Beginning in the 1980s climate change was first treated strictly as a scientific issue; to that end the State Meteorological Administration was given the responsibility of devising policy options for international negotiations. In the 1990s, the role shifted to an institution that evolved into the National Development and Reform Commission (NDRC) and is also the primary authority on energy policy decision-making. Currently, the National Coordination Committee on Climate Change oversees the climate activities within the NDRC, the Ministry of Science and Technology, the Ministry of Foreign Affairs and the State Environmental Protection Administration (SEPA). However, the NDRC and the Foreign Ministry are responsible for China's international negotiations and have primacy in setting their position.

#### 4.4.2 Domestic climate policies

In June 2007, China released its 'National Climate Change Program' (NDRC, 2007). This report provides a comprehensive synthesis of the current domestic climate policies. The policies are not climate policies per se but rather policies implemented throughout the economy that have the effect of reducing GHGs. Three policy areas are particularly important:

1. *Energy efficiency.* The aim of the policy is to quadruple the economic growth in the period 2000-2020 while only doubling energy consumption. The plan includes a goal to reduce energy intensity by 20% below 2005 levels by 2010. In 2006, a program was established to improve energy efficiency of the largest enterprises. The government is also making an effort to close down small, inefficient power plants by 2010, which in total produce 8% of the country's energy. The 1997 Energy Conservation Law is aimed at increasing energy efficiency in buildings, industry and consumer goods. In the transport sector China is implementing fuel economy standards that are already higher than Australia, Canada and the US (Lewis, 2007);
2. *Renewable energy.* In 2005, China adopted a National Renewable Energy Law that sets the target of increasing the amount of renewable sources of primary energy from 7% to 16% by 2020. For the electricity sector the target is set at 20%. Hydropower is projected to more than double by 2020. The solar energy industry is stimulated by tax and other incentives (Lewis, 2007);
3. *Industrial policies.* China has implemented measures to discourage growth in energy-intensive industries, such as increased export taxes. At the same time import tariffs on energy and resource products have been cut from between 3-6% to 0-3% aiming to promote the use of energy-intensive products produced elsewhere.

#### 4.5 Justice and Equity: Framing of the problem

The problem of climate change is framed by China primarily from the historical experience in modernizing and promoting its economy as well as from its response to pressures from developed countries. China's own perception of equity is formulated in a proclama-

tion that translates as ‘China’s principles and positions on global environmental problems’. It was issued July 1990 at the 18<sup>th</sup> meeting of the Environmental Protection Commission (EPC) of China’s State Council. The principles are “the responsibility of developed countries for global environmental deterioration, the harmony of both environmental protection and economic development, the recognition of developing countries’ right to develop, the sovereign equality of all states, and the need for new and additional funds for developing countries” (Jeon & Yoon, 2006). China’s responses in the climate negotiations are based on these principles.

#### 4.6 Opportunities in addressing climate change

##### 4.6.1 New policies and technologies

The greatest opportunities for mitigation lie in technology development and deployment. Priority areas are advanced coal technologies, energy-efficient building technologies, clean vehicle technologies and advanced industrial technologies (Lewis, 2007). The success of emissions control after Kyoto depends on the success of technology transfer of clean energy, wind, solar energy, efficiency technology from developed countries such as USA, Germany and Japan to China (Li, 2007).

##### 4.6.2 CDM potential

Given China’s large dependence on coal there is a large potential for emission reductions through the CDM. At its inception China was sceptical of CDM, seeing it as a mechanism whereby developed countries could escape their mitigation “responsibilities”. However, since COP-7 China has become an active supporter of the mechanism and is becoming one of the most attractive countries for CDM projects. China has the potential to generate half of the total worldwide annual Certified Emissions Reductions (CERs) of Annex I countries. In 2007 China accounted for 21% of the CDM projects, accounting for 51% of total CER volume. The areas where CDM will make a difference are also key areas of political focus for China: energy, energy efficiency and renewable energy development. The CDM potential thus is a promising way for China to reduce its GHG emissions (Heggelund, 2007).

#### 4.7 Negotiation positions and strategies

China’s position in the international climate negotiations rarely deviates from other developing countries. Their interests are collectively represented in the G77; instead of acting alone and as a result of fears of being singled out because of its increasing economic growth, China uses the G77 as buffer while simultaneously taking a leadership role (Lewis, 2007). Prior to presenting its position China ensures that they have strong support within the group. Along with the G77, China emphasizes the historical responsibility of the developed world in reducing GHG emissions and the great disparity between the per capita emissions of the developed and developing countries.

China resists any binding commitments to reduce its own GHG emissions. In September 2007, the Chinese foreign minister Yang Jiechi emphasized that developed countries should continue to take the lead in reducing emissions. Despite the fact that the EU is



willing to commit to relatively strong post-2012 commitments, as long as the US remains uncommitted to binding targets China will continue to avoid the discussion on taking on their own fixed targets (Lewis, 2007). In the 'National Climate Change Program' released June 2007, China also takes this position by defending the principle of common but differentiated responsibilities.

According to China "developed countries should fulfil their commitments of taking the lead to reduce their greenhouse gas emissions and providing financial assistance and technology transfer to the developing countries" (NDRC 2007: 59). China also claims to participate in regional cooperation but as they claim this 'should function as a helpful complement to the UNFCCC and the Kyoto Protocol rather than replacing or weakening them' (NDRC, 2007: 59).

China is especially keen on technology transfer that includes measures such as "establishing an effective technology cooperation mechanism to promote R&D, deployment and transfer of technology of addressing climate change" as well as "establishing a special fund for international technology cooperation so that environment-and-climate-friendly technologies are accessible and affordable to developing countries" (NDRC 2007: 59). During the Bali Conference in 2007, China "underscored the urgency of technology transfer and highlighted a technology transfer fund, cooperation between public and private sectors, and the need to consider both climate protection and intellectual property rights" (IISD, 2007a: 2).

## 4.8 Summary

### 4.8.1 Perception of affectedness

China's awareness to its vulnerability to climate change is relatively recent. While climatic changes have already taken place, according to recent Chinese reports the issue of vulnerability is not yet perceived as being of major importance in the international climate negotiations. There is a growing emphasis on economic support for adaptation in the international negotiations. China considers that there is a possible linkage between climate change and vulnerability of the poor and that their poverty reduction efforts could also contribute to elevating the climate issue on the political agenda (Heggelund, 2007).

### 4.8.2 Perception of justice and equity

China's own perception of equity formulated in the proclamation 'China's principles and positions on global environmental problems' informs its negotiation position. China resists any binding commitments to reduce their own GHG emissions by referring to the historical responsibility of the developed countries for global environmental deterioration. Thus in the perception of China, developed countries must take the lead in reducing their greenhouse gas emissions first while at the same time providing financial assistance and technology transfer to the developing countries. As long as the US does not commit to credible climate policy commitments, China does not perceive it to be just that they too must adopt binding commitments.

#### 4.8.3 Perception of opportunity

China's perception of opportunity informs their negotiation position as well. The primary Chinese institution involved in the international negotiations, NDRC, is responsible for climate change, energy policy as well as economic development. This is a clear indication of the economic importance that is placed on the issue. The trend of involving more economists in climate research and directly in the delegation further puts climate change into an economic perspective (Heggelund, 2007).

China justifies its economic growth and the accompanying increase of GHG emissions by pointing at the great disparity between the per capita emissions of developing and developed countries. At the same time it is seeking opportunities and technologies that might pose a lesser threat to its economic growth. It is therefore seeking international support for a technology transfer mechanism and a special fund for international technology cooperation. China is hoping to remove itself from the coal energy lock-in by acquiring environmentally friendly technologies with the financial support of developed countries. China aims to strengthen its negotiating leverage by leading the developing country alliance (G77) and by engaging in two distinct environmental regimes, the Kyoto Protocol and the US-led Asia-Pacific Partnership. China will probably remain committed to the Kyoto regime if future obligations do not constrain its economic growth. Moreover, China will continue to seek more opportunities for technology transfer through the Asia-Pacific Partnership (Jeon & Yoon, 2006).



## 5. India in the Post-2012 Negotiations

### 5.1 Introduction

India is the seventh largest country in the world with a population of over 1.2 billion people (second largest population in the world) and has a rapidly growing economy. It is a critical actor within the climate change negotiations for three reasons. First, a key substantive reason is that its rapidly growing economy itself implies a rapid rate of growth of greenhouse gas emissions. Second, from a political perspective should India decide to follow the lead of the US and 'go unilateral', the climate change problem may not be addressed. Third, the impacts of climate change are likely to be significant on the Indian population. If the impacts on water and agriculture are serious and affect human security, this may lead to a major destabilization of the economy with spill-over effects in the region.

### 5.2 Country profile of India

#### 5.2.1 Socio-economic profile

With a very large population and increasing urbanization, a GDP of US\$ 805 billion and a per capita income reaching US\$ 736, India faces large domestic challenges. Ranked 128<sup>th</sup> in the human development index, it has to provide education, water and sanitation and health services to a substantial portion of its population. At the same time, sustained economic growth and increased demand for goods and services implies that India's demand for energy will increase rapidly. In 2002, India's commercial energy supply was about 3.4% of world's commercial energy supply and roughly 12% of Asia-Pacific's energy consumption and this will change rapidly. Table 5.1 below gives an outline of important socio-economic indicators.

Table 5.1 Overview of selected socio-economic indicators for India.

Population 2005 (millions)	1,134.4
Annual population growth rate	2.0 (1975-2005)
	1.4 (2005-2015) *1
Urban population (% of total) *4	21.3 % (1975)
	28.7 % (2005)
	32.0 % (2015) *1
GDP 2005	805.7 (US\$ billions)
	3,779.0 (PPP US\$ billions) *5
GDP per capita 2005	736 (US\$)
	3,452 (PPP US\$) *5
GDP growth rate (%)	3.4 % (1975-2005)
	4.2 % (1990-2005)
Human development index 2005 (# and ranking)	0.619 (ranked 128, medium human development)
Human poverty index 2005 (# and ranking)	62
Population below 2 USD and 1 USD a day 1990-2005 (%) *2	80.4 % (below 2 US\$ a day)
	34.3 % (below 1 US\$ a day)
Imports of goods and services (% of GDP)	24 % (2005)
	9 % (1990)
Exports of goods and services (% of GDP)	21 % (2005)
	7 % (1990)
ODA received *3	1,724.1 (mln US\$ 2005)
Net FDI inflows (% of GDP 2005)	0.8 % (2005)
	0.1 % (1990)

Source: UNDP (2007).

\*1 Data refer to medium-variant projections.

\*2 Data refer to the most recent year available during the period specified.

\*3 ODA receipts are total net ODA flows from DAC countries as well as Taiwan Province of China, Czech Republic, Hungary, Iceland, Israel, Republic of Korea, Kuwait, Poland, Saudi Arabia, Slovakia, Turkey, United Arab Emirates and other small donors, including Estonia, Latvia, Lithuania.

\*4 Because data are based on national definitions of what constitutes a city or metropolitan area, cross-country comparisons should be made with caution.

\*5 World Bank estimate based on regression.

### 5.2.2 Energy and environment profile

The National Communication (GoI, 2004) reveal that India's emissions of greenhouse gases for 1994 – the baseline year - are 65% CO<sub>2</sub>, 31% from methane, and 4% from nitrogen oxide. The energy sector emits 61%, the agricultural sector 28% and the industrial processes sector emits 8%, waste 2%, while land use contributes only 1%. Its per capita emissions were 0.87 tons of CO<sub>2</sub> in 1994. The second National Communication is presently under preparation.

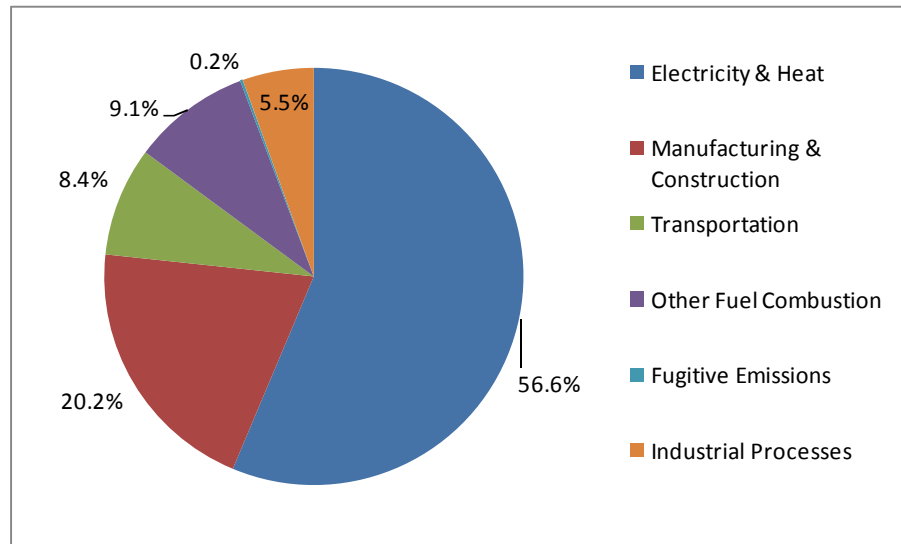


Figure 5.1 India GHG emissions by sector in 2004 (excludes land use change)  
(Source: based on WRI, 2008).

On the one hand, 487 million people do not have access to electricity in India and on the other hand the current population growth rate calls for extremely high electricity growth rates for the industry. The government has prioritized both sectors. It aims to meet *all* rural energy needs rapidly while also catering to the growing needs of the industrial sector. The Accelerated Rural Electrification Programme and Household Modernization and the National Electricity Plan aim to increase the per capita electricity consumption from 567 kWh in 2002-03 to over 1,000 units by 2012. Furthermore, all villages were to be electrified by 2007 and power must be provided by 2012. The National Electricity Policy states that a 7.4% growth rate will call for a capacity addition of 91,800 MW in the 11<sup>th</sup> plan period. To meet a growth rate of 8% electricity supply must grow by 12% (GoI, 2004a).

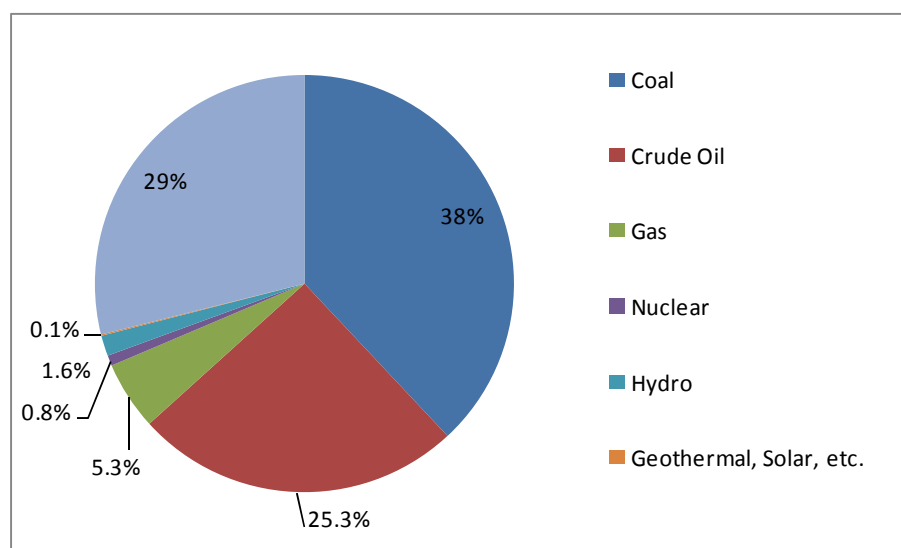


Figure 5.2 India Total Primary Energy Supply (TPES) by source in 2005  
(Source: based on IEA, 2007).

The government is thus actively investing in new power plants in its effort to meet urban and rural needs (Perkins, 2005, IEA, 2002).<sup>1</sup> There is considerable discussion about how to choose between coal, nuclear, large hydro plants and renewables (Gupta *et al.*, 2001) but many experts feel that the renewables will only be able to provide a small percentage of the needs. The government estimates that it needs an investment of about Rs. 800,000 crores (US\$ 182.8 billion; GoI, 2001). Nevertheless, key policies include promoting renewable sources of energy, accelerating the growth of hydropower, renewed focus on nuclear power, and use of gas and environmental friendly technologies for fossil fuel power generation and renovation and modernization of thermal and hydro power plants including life extension.

*Table 5.2 Overview of selected energy and environment indicators for India.*

Electricity consumption per capita in kWh	618 (2004)
	77.6 (% change 1990-2004)
Population without electricity	487.2 (2005)
Total primary energy supply (TPES) 2005 (Mt of oil equivalent) *1	537.3 (2005)
	319.9 (1990)
CO <sub>2</sub> emissions 2004 (Mt CO <sub>2</sub> )	1,342.1 (2004)
	681.7 (1990)
	6.9 (% annual change)
CO <sub>2</sub> per capita (t CO <sub>2</sub> )	1.2 (2004)
	0.8 (1990)
% of world total	4.6 % (2004)
	3.0 % (1990)

*Source: UNDP (2007).*

\*1 Total primary energy supply (TPES) is made up of 'indigenous production + imports – exports - international marine bunkers ± stock changes'. TPES is a measure of commercial energy consumption. In some instances, the sum of the shares by energy source may not sum up to 100% because pumped storage generation has not been deducted from hydroelectricity generation.

The UNDP projections for India's energy related CO<sub>2</sub> emissions remain relatively modest in relation to that of the European Union, the US and China (see Figure below).

<sup>1</sup> For an analysis of the potential impacts of the Electricity Act, see Thakur *et al.* (2005).

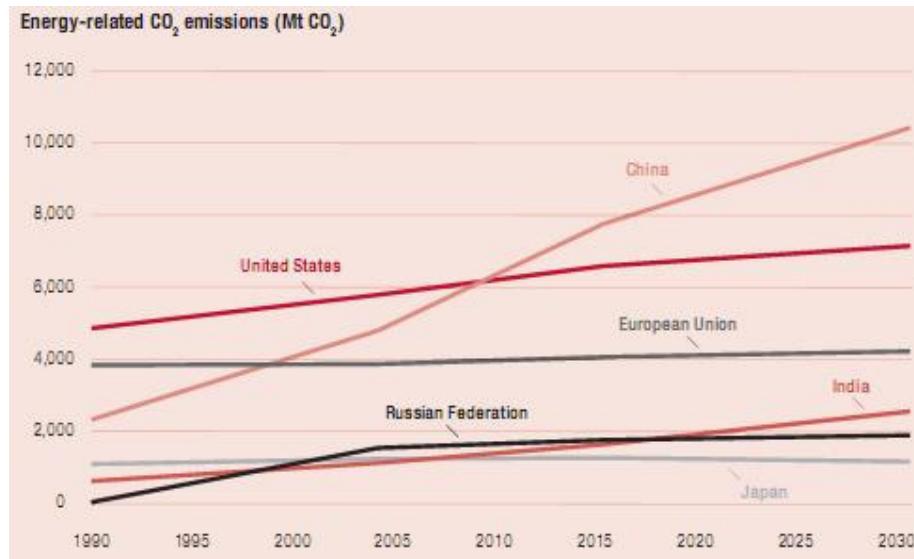


Figure 5.3 Business-as-usual CO<sub>2</sub> emissions on a rising trend (Source: IEA (2006) in UNDP (2007)).

### 5.3 Affectedness: Physical and social vulnerability

The Indian National Communication reveals that the country's mountain zones are vulnerable to glacier melting; the agricultural zone and India's water resources supply is vulnerable to the expected changes in monsoon patterns; this will threaten water and food security as well as the local ecosystems; the coastal belt is subject to the challenges posed by sea-level rise; and human health problems are expected to be exacerbated as vectors shift northwards. Although there is some discussion of the impacts, these have neither been quantified, nor integrated into the analysis of potential climate policy. However, in 2007 a national council was set up with the primary task of investigating this issue.

What is undoubtedly clear is that India's existing vulnerability to floods and droughts and extreme weather events will be further exacerbated. The challenge of water and food security will become more severe.

### 5.4 Institutional context

#### 5.4.1 Participation in international institutions

India is an active member of the G77 and its policy summits. In general India plays a role in shaping the position of the G77 and its own position is shaped by the G77 position.

India is also active within BRIC – a new coalition of Brazil, Russia, India and China. According to a Goldman Sachs report of 2003, this group of countries can become the globally dominant economic players by 2050, with Brazil and Russia providing key resources to the global community, and China and India being major suppliers of goods and services. There are reports of collaboration between these countries and of agreements being made between them however the contents of these reports are not easily or readily accessible.



India participates in most international treaty negotiations and through several of these (FCCC, 1992; CBD, 1992; UNCED, 1992) it has committed itself to the target of sustainable development. Under the various competing international energy regimes, including the International Energy Agency (IEA) and the International Atomic Energy Agency (IAEA)<sup>2</sup>, there are no clear obligations for India to choose any specific energy source over another. India as a partner in the 2003 International Partnership for a Hydrogen Economy is also, passively, according to interviews, exploring the potential for cooperation on hydrogen research (Sindico and Gupta, 2004).

India ratified the UNFCCC in 1993 and ratified the Kyoto Protocol in 2002. It has therefore undertaken to adopt qualitative policy measures.

India has also entered into several bilateral and multi-lateral partnerships. These include The EU and India Partnership on Climate Change; The Asia-Pacific Partnership for Clean Development and Climate and the International Partnership on the Hydrogen Economy (as mentioned above). In 1999, a Joint Statement on Cooperation in Energy and Related Environmental Aspects was signed by India and the United States. In 2000, Prime Minister Vajpayee and President Clinton signed a "Joint Statement on Cooperation in Energy and Environment Between India and the United States". Several follow-up actions have since been taken.

#### 5.4.2 Domestic climate policies

Before addressing domestic climate policy, it may be useful to briefly discuss India's institutional framework. India has more than seventy ministries and responsibilities on the various climate change related issues are distributed throughout the different ministries. Development issues fall under the National Development Council (consisting of Planning Commission Members and Chief Ministers from all states) and the Planning Commission. Energy falls under four ministries, the ministries of Power, Non-Conventional Energy, Coal and Nuclear Power. Agriculture is governed by the Ministries of Agriculture, Food Processing Industries, Chemicals and Fertilizers; the key ministries engaged in water are the Ministries of Water Resources, Power and Agriculture. The ministries working on climate change are the Ministries of Environment and Forestry, and Science and Technology as well as the other above-mentioned ministries. The horizontal distribution of mandates makes it very difficult to make coordinated climate change policy. While the Ministry of Environment and Forestry coordinates the implementation of the Clean Development Mechanism (CDM), and the preparation of the National Communications for the UNFCCC, it has limited authority over the other issues.

In 2007, the Government set up the Council on Climate Change with representatives from the Prime Ministers Office, the Deputy Chairman of the Planning Commission, the ministries of External Affairs, Finance, Agriculture, Environment, Water, and Science and Technology and others such as the National Manufacturing Competitiveness Council, the Economic Advisory Council and the Bureau of Energy Efficiency and several NGOs. This body does not include the ministries of Energy and may thus have a greater focus on adaptation. It released a strategy document in June 2008, which is currently being distributed but at the time of writing was not currently available on the web.

---

<sup>2</sup> Although IEA focuses on issues of importance for the OECD countries it maintains contacts with the Indian government. The IAEA focuses on nuclear energy.

Another critical domestic factor is that India has a federal system resulting in authority that is divided between the national government and the provinces. This division of authority implies that most agriculture, energy and water related issues are in the hands of the provincial governments except forestry, nuclear energy and petroleum, and inter-state water disputes. This vertical distribution of authority makes it very difficult to make an integrated climate change policy that can also be implemented at the state level especially as states are allowed to have different visions on how to develop. As part of the global governance trend to de-centralize authority to lower authorities, India is also engaging in such efforts and this will make the development of a coherent climate policy even more difficult.

Although the Indian constitution obliges India to respect international law and treaty obligations,<sup>3</sup> it does not allow for international treaties to automatically become part of national law. Active legislation within India is necessary. The Eighth Five Year Plan (1992-1997) did not discuss climate change but the Ninth Five Year Plan (1997-2002) did make some recommendations relevant to climate change. Formally India does not see itself as obliged to take on quantitative obligations with respect to climate change. However, as party to the climate treaties it is obliged to take on a number of responsibilities in line with Article 4 of the Convention and Article 10 of the Protocol. India's policies that are relevant in relation to climate change include:

- Sustainable development is focused on conserving rivers, improving urban air quality and forestation;
- The national forestry policy calls for one million hectares to be planted annually.
- An Environment Information System has been adopted to help collect relevant information so that policies can be crafted based on this information. A GLOBE system (Global Learning and Observations to Benefit the Environment) also supports this process;
- Liberalization of the energy sector which is expected to rationalize energy production, pricing and supply and thereby enhance the efficiency of the process;
- The creation of the Ministry of Non-Conventional Energy in 1992 provides a major focus on promoting renewable energy and although it has limited funds, it over-achieved on the targets set in the Eighth Five Year Plan;
- The Energy Conservation Act, 2001, (in force since 2002) promotes efficient use of energy and its conservation through, *inter alia*, the creation of the Bureau of Energy Efficiency (BEE) to promote energy conservation and demand side management; the adoption of standards and labelling for energy-intensive equipment and appliances used in sectors such as industry, households, and agriculture; mandatory energy audits through accredited auditors and a market development mechanism including project development to be taken up in rural agricultural sub-stations with private management; municipal /metro water pumping efficiency; and energy-efficiency improvements in government buildings, commercial buildings, railways, defence establishments etc.;
- National Energy Conservation Awards from the Ministry of Power provide an incentive for innovative conservation measures;
- The Electricity Act (EA 2003) provides the present legal and regulatory framework;

---

<sup>3</sup> Article 51 of the Constitution of India.

- The National Agriculture Technology Project in the Ninth Five Year Plan (1997-2002) to strengthen research, education and human resources development in the field of climate change and agriculture, through the national research grid;
- The National CDM Authority (NCDMA) promotes the development of CDM projects;
- The inclusion of scenarios of climate change in planning the Konkan Railway in western India (Shukla *et al.*, 2004);
- An active Judiciary has passed several judgments that have led to fuel switch in the public transport sector and to higher standards in the car sector.

With respect to adaptation, The Government of India has limited policies. In 1991, a Coastal Zone Regulation Notification was passed calling on the provinces to prepare appropriate policies. In 1992, the Conservation Strategy of the Government of India did, however, mention the need to develop coping mechanisms to deal with climate change.

Although the National Communication (GoI, 2004) to the secretariat recognizes that climate change is likely to have different types of impacts, actual measures taken to deal with climate change are limited. However, there are measures to deal with climate variability. In the area of disaster management, which is a state subject, the central government (i.e. the Ministry of Home Affairs for disaster relief and the Ministry of Agriculture on drought management) only intervenes when states are unable to take action. A National Drought Early Warning System and an inter-departmental Crop Weather Watch Group (CWWG) are active in dealing with drought and its impacts on climate change. Each state often has a complementary structure to deal with climate variability.

Other programs include the Drought Prone Areas Programme (DPAP), Desert Development Programme (DDP), Watershed approach (A hydro-geological approach for in situ soil and water conservation), Food for work Programme, Employment, Assurance Scheme (EAS), Jawahar Gram Samridhi Yojana (JGSY, Pradhan Mantri Gram Sadak Yojana (PMGSY), Antyodaya Anna Yojana (AAY), National Old Age Programme (NOAP), Integrated Child Development Scheme (ICDS), and Mid Day Meal for school children; however not all these programs work as well as intended (Kerr *et al.*, 2002).

### 5.5 Justice and Equity: Framing of the problem

Since 1989, when climate change hit the political agenda, the Indian Government has taken the view that the bulk of greenhouse gas emissions have been emitted by the developed countries and that they are responsible for taking action first. This view is in line with the framing of the Climate Change Convention and its key principle of common but differentiated responsibilities.

Although India is now rapidly developing, it still has 70% of the population living in very dire circumstances and domestic social issues are critical to domestic security and stability. It continues to emphasize Article 4.7 that far-reaching actions must be dependent on the technology and assistance provided by developed countries to the developing countries.

Interviews conducted in India on a regular basis underscore that India continues to feel that it is being victimized by a problem essentially created by the developed world. The Prime Minister recently called for 'climate justice', a 'fair, equitable and transparent

global regime for technology transfers' based on the principle of common but differentiated responsibilities (from the Prime Minister's speech of February 7, 2008).

## 5.6 Opportunities in addressing climate change

### 5.6.1 New policies and technologies

The energy sector could use modern low carbon technologies and super critical boilers. A number of technologies have been explored in different reports on the subject. (Gupta *et al.*, 2001).

India has received more than US\$ 500 million from the GEF and about 95% of the resources focus on electricity. 87 climate change related technology transfer projects undertaken in India have been identified of which most are relevant in the electricity sector and account for about 71% of all registered technology transfer projects in India.

At the same time, technology transfers are not always successful. Jacobson (2000; 409) argues that the installation of photovoltaic systems in Ladakh were successful, but that the state's "focus [...] on installing new systems, [and] not on building a maintenance infrastructure" would "likely result in future problems, as systems [...] will fail prematurely".

### 5.6.2 CDM potential

At present, India's average annual reductions of GHGs via CERs is estimated at 30, 566, 630 tonnes (UNFCCC website) and India has the largest number of registered projects. India is seen as an attractive host country (Point Carbon, 2005) as it has an institutional framework to deal with CDM and promote renewable energy and demand side management and a wealth of local expertise to serve as project developers (Babu and Michaelowa, 2003; Gupta, 1997; Gupta *et al.*, 2001; Interviews, 2005). However, the government process is bureaucracy laden, not always transparent, and is seen as slow, difficult and laborious, with high transaction costs, no guarantee of reasonable prices for the CERs, difficulties in proving additionality and developing baselines (Gupta *et al.* 2007). The CDM potential in India however is significant, but if there are limited quantitative targets in the post-2012 period, the price of CERs will fall and the market may collapse.

## 5.7 Negotiating positions and strategies

In 1989, the Indian Government argued that climate change was a global problem and "it may be counter productive to lay down targets for countries which are still striving to raise the living conditions of their masses. It may be equally counter-productive to reach agreements to combat climate change, without devising mechanisms to ensure global participation" (Noordwijk Conference Report, 1990). The Government stated in its preparatory documents for the 2002 World Conference on Sustainable Development, that India's climate policy had three elements, first that the primary responsibility lay with the developed countries, second that development priorities would be seen as the driver for action in the developing countries and that the developed countries should help the developing countries through aid and technology transfer. The key justification of this position is that the per capita emissions have been very low.

Until 2004, a complete assessment of the situation of India had not been made. In 2004, the National Communication for the first time highlighted the key emissions of India and the possible impacts of climate change on India using 1994 as the base year. Until that period much of India's climate strategies at the international level were based on educated guesses. With a greater degree of formalization and understanding of India's own role, its policies are becoming more informed. In the domestic context, policies are being crafted to meet other goals such as energy security, and to some extent climate change is factored into the discussions if not into the decisions.

In 1995, the Indian government prepared a paper calling for developed countries to reduce their emissions by 20%. Then India convinced other developing countries to join in this process and isolated the OPEC countries. The joint pressure of the developing countries and the European Union ultimately influenced the adoption of the Berlin Mandate in 1995 (Mwandosya, 1999). However, the subsequent adoption of relatively weak targets, market mechanisms that allowed for reductions of emissions outside the home country context and the reluctance of the US to participate in the process has further supported the decision of India to take a defensive stance in the international negotiations. The Indian National Communication states that although it will use its fossil fuels, "by consciously factoring in India's commitment to the UNFCCC, [they] have realigned economic development to a more climate friendly and sustainable path" (GoI, 2004). By the early years of this decade, the sudden rise in the rapid growth rate of India was another reason that supported this defensive stance. In June 2007, Pranab Mukherjee stated at the G-7 meeting in Hamburg: "The mitigation regime must not reduce the prospects for economic growth and poverty alleviation" in developing countries. The position of India at Bali in December 2007 remained in line with its earlier statements. And India increasingly sees its participation in the CDM as its key contribution to reducing greenhouse gases. However the rising fuel and food prices in mid-2008 may have an impact on India's climate policy.

## 5.8 Summary

### 5.8.1 Perception of affectedness

Although India is likely to be seriously affected by the impacts of climate change as a result of the melting glaciers along the Himalayan belt in the north of India, sea-level rise along the east and west coast of India, changing rainfall patterns on central India, the recognition of how serious these impacts may be remains rhetorical. Possibly the Climate Change Council will seriously assess these impacts resulting, in the best case, in an influence on both understanding and strategy.

### 5.8.2 Perception of justice and equity

India takes a strong moral position in the climate change issue. Its per capita greenhouse gas emissions have been relatively insignificant for the last fifteen years of the climate change regime and have only recently begun to increase slightly. It believes that the developed countries have failed to demonstrate leadership in actually significantly reducing their own emissions and the US position clearly sets a poor example.

Even though domestic discussions do take climate change on board at least in the energy sector, at international meetings the focus of the negotiators is on the need for the developed countries to address the problem in an equitable manner.

### 5.8.3 Perception of opportunity

India sees the CDM as an opportunity for economic growth and its active participation in developing such projects is evidence of this. For the rest, national policy adopts modern sustainable development ideas to the extent that they are affordable and effective in the Indian context.



## 6. South Africa in the Post-2012 Negotiations

### 6.1 Introduction

This chapter focuses on Africa's most industrialized country, South Africa. In the wake of apartheid, South Africa has been faced with the double challenge of continuing stable economic growth and eradicating poverty, while at the same time reducing the greenhouse gas intensity of its economy. South Africa's position in the post-2012 negotiations is likely to be determined by the question of whether addressing climate change goes hand-in-hand with dealing with these socio-economic challenges.

This chapter provides an overview of the social and political factors relevant to South Africa's position in the post-2012 negotiations, and provides an indication of South Africa's behaviour so far in these negotiations. The chapter first provides a country profile of South Africa, focusing on key socio-economic and climate change and energy indicators. It then gives an overview of the country's international commitment and the domestic climate change and energy policies in place. Given this background, it goes on to examine the South African negotiation position since COP-11. On the basis of the foregoing analysis, the country's perceptions on equity, opportunity and affectedness are summarized.

### 6.2 Country profile of South Africa

#### 6.2.1 Socio-economic profile

South Africa is in a peculiar position, with a dual economy showing both characteristics of a developing country and of an industrialized country. The legacy of the apartheid era included an economy that was heavily dependant on mineral production and processing, as well as a set of development challenges that include "a dramatic gap between rich and poor, a heritage of racial oppression and inequality, a lack of infrastructure, high levels of unemployment and urbanization, an economy adjusting to globalization, and the new challenge of AIDS" (Winkler & Marquard, 2007: 1).

After the end of apartheid in 1994, South African policies have been driven by 1) resolving the macro-economic problems resulting from apartheid; and 2) providing services and employment for the majority of the population (Winkler & Marquard, 2007). Although the South African government hopes to diversify its economy by moving away from the minerals and energy dominated model of the apartheid regime, these sectors still account for a large part of the country's income (Winkler & Marquard, 2007).

South Africa still faces severe social issues. About 27% of the population of 47.9 million is without jobs. Furthermore, over a third of the people are living on less than US\$ 2 a day, of which one third again are living in extreme poverty (less than US\$ 1 a day).

The most important sector of the South African economy is the services sector, although industry also accounts for about 20% of GDP. Although mining is still important, its share in GDP is slowly declining (Winkler & Marquard, 2007). South Africa's imports



and exports mainly involve mineral production and processing and the energy sector (Winkler & Marquard, 2007). In financial terms, the European Union is of importance to South Africa, given that it is its largest trading partner, the main source of FDI, and the principal provider of official development assistance in 2005 (Murphy *et al.*, 2008).

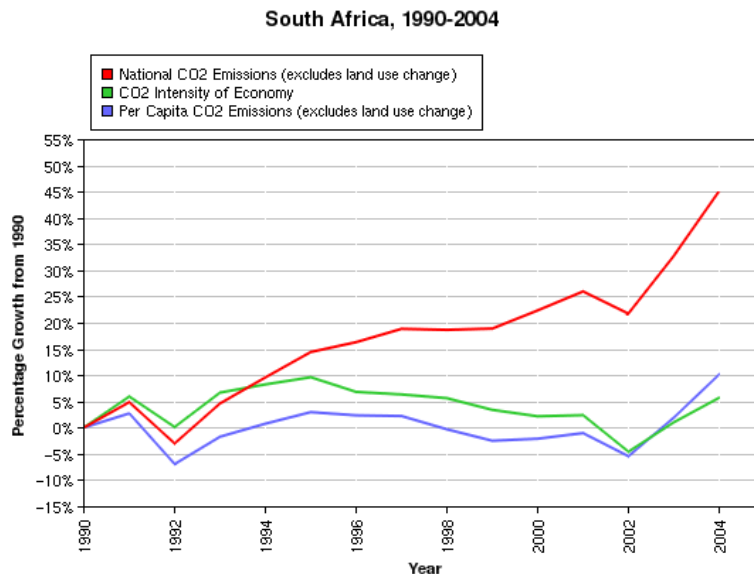
*Table 6.1 Overview of selected socio-economic indicators for South Africa.*

Population in 2005	47.9 mln
GDP in 2005	239.5 bln US\$
GDP per capita in 2005	11,110 US\$
Human development index 2005 (and ranking)	0.674 (ranked 121, medium human development)
Population below:	
- 2 US\$ a day (1990-2005)	- 34.15%
- 1 US\$ a day (1990-2005)	- 10.7%
Unemployment rate in (1996-2005)	26.6%

*Sources: UNDP (2007); World Bank (2007).*

### 6.2.2 Energy and environment profile

Although classified as a developing country, South Africa has a carbon footprint that is comparable to some developed countries. South Africa is the world's 12<sup>th</sup> largest CO<sub>2</sub> emitter (accounting for almost 1.5% of the world's emissions). Even though total emissions grew significantly between 1990 and 2004, emissions per capita, as well as the overall carbon intensity of the economy have only increased slightly in this period (see Figure 6.1). Still, emissions per capita are close to developed countries and high compared to other major developing countries.



*Figure 6.1 Development of energy indicators 1990-2004 (Source: WRI, 2008).*

The relatively high intensity is related to the dominance of coal in the energy supply (72%; see Figure 6.2). The abundance of coal has led to a low electricity price, which in turn has kept the share of other sources (e.g. natural gas or renewable energy) in the

energy mix rather small. Renewable energy consists mainly of biomass, co-fired bagasse, small hydro, and to a small extent solar (Winkler, 2005). Given the energy mix, the energy sector is by far the largest emitting sector in the country (see Figure 6.3), followed by manufacturing and construction, and the transport sector. Although there is little information on non-CO<sub>2</sub> emissions, the main emissions stem from agriculture (methane emissions from livestock), as well as industrial processes and waste (Winkler & Marquard, 2007). The only significant important CO<sub>2</sub> sink is through afforestation, as South Africa has one of the largest man-made forestry resources in the world, covering about 1.5% of the cultivated land (RSA, 2000).

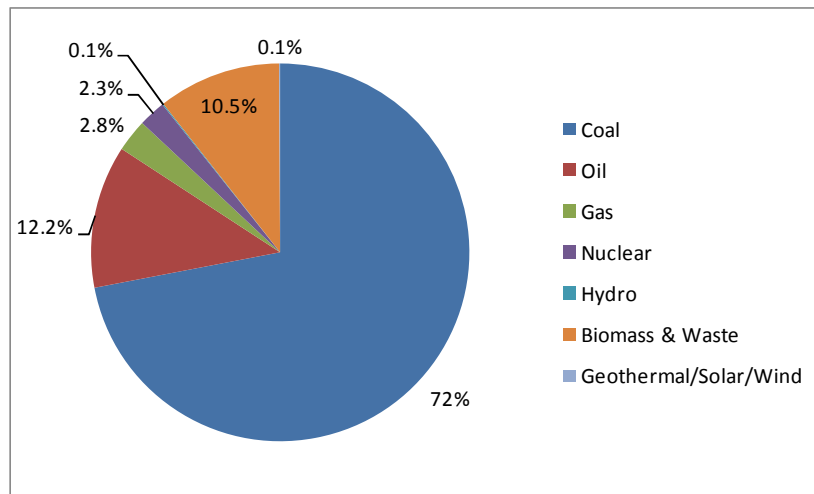


Figure 6.2 South Africa's Total Primary Energy Supply (TPES)<sup>4</sup> in 2004 (based on IEA, 2007).

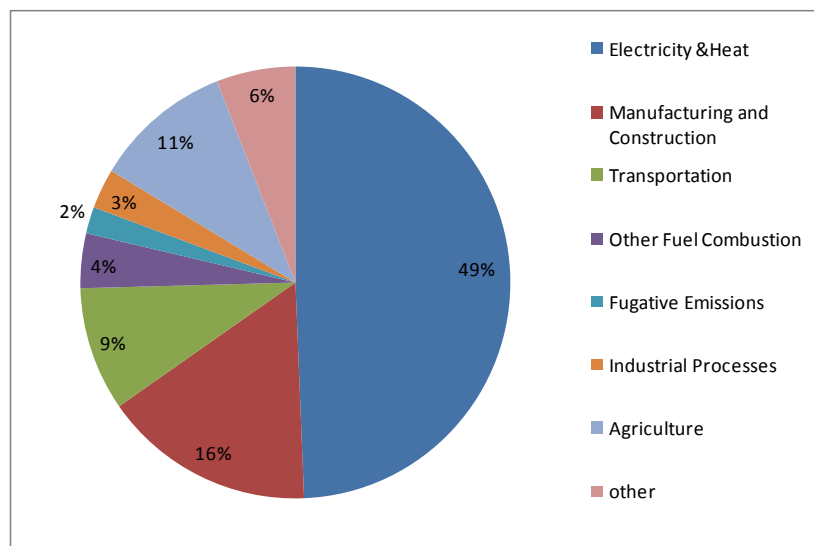


Figure 6.3 Greenhouse gas emissions in 2000 according to sector (based on WRI, 2008).

<sup>4</sup> TPES is a measure of commercial energy consumption.

Much of the (rural) population in South Africa is still without access to grid electricity (14 million, or about 30% of the population). While the South Africa government has been aiming to provide universal access to electricity, between 1994 and 1999 progress was made in achieving this goal, electrification has been proceeding slowly (Winkler & Marquard, 2007). There are calls to expand electrification objectives to ‘energization’, meaning that the government also needs to provide non-electrical energy services to those people still lacking them (Winkler, 2006).

*Table 6.2 Overview of selected energy and environment indicators for South Africa.*

CO <sub>2</sub> emissions in 2004	
- total	- 427,9 Mt
- % of world total	- 1.44%
Greenhouse gas emissions in 2000, including land-use change	443.3 Mt CO <sub>2</sub> -eq.
CO <sub>2</sub> per capita in 2004	9.2
Population without electricity in 2005	14 mln
Electrification rate (2000-2005)	70%
Forest area in 2005 (% of total land area)	7.6%

*Sources: UNDP (2007); WRI (2008).*

### 6.3 Affectedness: Physical and social vulnerability

South Africa’s Initial National Communication (RSA, 2000) provides an assessment of potential climate change impacts for the country. Based on an expectation of a 1-3 degree Celsius rise in temperature in the next fifty years, South Africa expects to have a doubling of cases of malaria with an additional 5.2 million people at risk as a result. Bilharzia is also expected to rise significantly. Other major impacts relate to its water resources. Due to alterations in the intensity and seasonality of rainfall, there is a risk of enhanced desertification in an area nearly as large as half of South Africa. Water shortage is expected to impact the cattle range by about 10% and the risk of fires is expected to rise. The production of maize may decrease by 10-20%. Other specialty crops in agriculture may also be at risk. Furthermore, forests and the forestry industry will face increased difficulties due to increased aridification. Finally, climate change, in combination with population growth and increasing per capita consumption will result in major changes to biological diversity, with the area covered by current biomes reduced between 38% to 55% by 2050.

Interestingly, the National Communication also highlights the impacts of response measures by Annex I countries (RSA, 2000). As South Africa is one of the world’s leading coal exporters, reducing the use of coal in the developed world would likely have a negative impact on South Africa’s economy (Paredis *et al.*, 2007). The country seems to be struggling between the recognition that fossil fuel production could have negative local and global impacts, and the desire to protect its industries (DEAT, 2004).

## 6.4 Institutional context

### 6.4.1 Participation in international institutions

South Africa ratified the UNFCCC in 1997 and the Kyoto Protocol in July 2002. The country plays a role in two major negotiation groups, the G77 and China, and the African Group. The country is also involved in a number of non-UN initiatives, including the Major Economies Process launched by the United States, the G8+5 Gleneagles Dialogue, and the Carbon Sequestration Leadership Forum (focusing on the promotion of CO<sub>2</sub> capture and storage). Recently, South Africa intensified its relations with the EU, notably through the establishment of a strategic partnership (Murphy *et al.*, 2008). As part of the implementation of the partnership, the EU and South Africa established the Mogôbagôba Dialogue (Council of the European Union, 2007). This dialogue will include discussions on the environment and climate change.

The lead ministry for the international climate change negotiations is the Department of Environmental Affairs and Tourism (DEAT). The negotiations are conducted in partnership with the Department of Foreign Affairs (DFA). The ministry's position is informed by discussions in the National Committee on Climate Change (NCCC) (DEAT, 2004; Goldblatt & Middleton, 2007). The NCCC is an important institution in this coordination of climate policy development and implementation. It is a stakeholder forum that includes representatives from various ministries, other levels of government, business, industry, and NGOs. Although the NCCC has played a useful role in bringing various stakeholders together, it is limited in its mandate to advise only DEAT and therefore cannot influence decision-making in other departments (Goldblatt & Middleton, 2007).

### 6.4.2 Domestic climate policies

South Africa is developing a range of laws and policies in the area of climate change and energy, the most important of which are outlined below. It has been noted that even though these policies have been put in place, implementation is still lagging (Winkler & Marquard, 2007).

The 1998 *White Paper on Energy Policy* presents the South African government's energy policy until 2010 (DME, 1998). The White Paper places South Africa's energy policy in the context of national objectives of employment creation, and economic growth. More specifically, it states the following five objectives for the energy sector:

- Increasing access to affordable energy services;
- Improving energy governance;
- Stimulating economic development;
- Managing energy-related environmental and health effects;
- Securing supply through diversity.

The *White Paper on Renewable Energy* is the next main policy document (DME, 2003b). The vision of the role of renewable energy is "[a]n energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation" (DME, 2003b: 1). The White Paper sets a medium-term target of an additional 10,000 GWh renewable energy contribution to final

energy consumption by 2012, mainly through biomass, wind, solar and small-scale hydro (DME, 2003b).

In 2005, the Department of Minerals and Energy (DME) published its *Energy Efficiency Strategy* (DME, 2005). The Strategy sets a national target for improving energy efficiency by 12% by 2015.

The legal framework in South Africa includes a number of laws and regulations, the most important being the Air Quality Act 39, which covers both local and global pollutants, and requires the drafting of pollution prevention plans.

Finally, a recent development relevant for the purposes of this chapter is that in 2007, the ANC proposed for the first time that South Africa sets a greenhouse gas emissions reduction target (ANC, 2007).

The main ministry responsible for coordinating South Africa's response to climate change, including the implementation of international agreements at lower levels, is also DEAT. According to South Africa's *Climate Change Response Strategy*, DEAT needs to coordinate with other government departments, including DME and DFA, to ensure that climate change policies are compatible with other priorities (DEAT, 2004).

In addition to the various ministries and government bodies, the Designated National Authority (DNA), which plays a key role in approving Clean Development Mechanism (CDM) projects, has been active since 2004.

## 6.5 Justice and Equity: Framing of the problem

Although South Africa acknowledges the urgency of the climate change problem, it is faced with the challenge of addressing its own development priorities first. Hence, the only way of framing climate change in an acceptable manner is by emphasizing the local sustainable development co-benefits of climate change policies. The country's *Climate Change Response Strategy* illustrates this point. The document emphasizes that development comes first and that responses to climate change need to be "within the context of the present economic realities of the country and the inequitable distribution of global wealth" (DEAT, 2004: iii). The report further highlights that some officials might see climate policy as going "against national development priorities" (DEAT, 2004: 10). However, the report lists a number of opportunities to exploit synergies between development goals and sustainable development.

Halsnæs *et al.* (2008) indicate that South Africa's participation in international climate policy could result in significant costs with negative impacts on development priorities, such as energy affordability, if there is no form of compensation. Hence, side-payments, in the form of enhanced technology transfer and the provision of financial resources from developed countries, are seen as a necessary component of international climate change action (DEAT, 2004).

## 6.6 Opportunities in addressing climate change

### 6.6.1 New policies and technologies

Given the challenges faced by the country, new policies and technologies will be needed. Although “a limited set of mitigation options has been relatively well explored” (Winkler & Marquard, 2007: 17), there are still multiple options for South Africa to limit its greenhouse gas emissions. Winkler (2006; 2007), summarizing the results of a large research project, discusses a set of possible energy policies that could be adopted, including policies aimed at:

- Higher energy efficiency in industry, commercial buildings and the residential sector;
- Increasing the biodiesel production;
- Increasing the share of renewable electricity, including the capacity of nuclear energy production and increasing imported hydropower;
- Increasing natural gas imports; and
- Introducing a tax on electricity generated by coal.

The research project concludes that energy efficiency measures, especially in the power and industrial sectors, hold the most potential when assessed in the light of sustainable development indicators (Winkler, 2006; 2007). Notwithstanding the potential of energy efficiency measures, there is further potential on the energy supply side through a diversification of the energy mix (including renewable energy and natural gas), and through the deployment of clean coal technologies.

Although the theoretical potential of renewables in South Africa is enormous, they have only played a small role so far in meeting the objective of increasing access to electricity, mainly through increasing off-grid electrification (Winkler, 2005). To increase the share of renewables in the energy mix, new policies are needed. One option is to increase the import of hydropower from other African countries, notably the Democratic Republic of Congo (DRC) (Winkler *et al.*, 2007; Halsnæs *et al.*, 2008). South Africa could use its existing ties through the Southern African Development Community (SADC) to exploit this potential. Halsnæs *et al.* (2008: 214) conclude that the hydropower potential for South Africa is “fairly robust” although its implementation in the region “will have to overcome many political barriers”. One of these barriers is that South Africa would become increasingly dependent on energy imports (Winkler, 2007). Another option that is being considered is nuclear energy, which is currently undergoing a “renaissance” (Winkler & Marquard, 2007: 14). The state-owned utility Eskom is developing a so-called Pebble-Bed Modular Reactor, and has further plans to enhance nuclear capacity. Furthermore, although the technology does not feature in any policy documents or strategies, there appears to be interest in increasing the use of hydrogen technologies in South Africa (e.g. DEAT, 2005).

Another option is to enhance the share of natural gas by increasing imports. Small amounts are already imported from Namibia and Mozambique. However, as in the case of hydropower, this option would make South Africa’s energy supply more dependent on imports (Winkler, 2007).

Other technologies focus on cleaning the energy supply by reducing emissions from coal. Clean coal technologies for power production, such as pulverized fuel combustion,

integrated gasification and combustion, and coal-powered fuel cells are not yet available, but could become so in the medium to long term (Winkler, 2006). Another technology that holds significant potential is carbon capture and storage (CCS). Mwakasonda and Winkler (2006) examined the promises and pitfalls of the technology for South Africa. The heavy reliance on coal will very likely continue in the foreseeable future (DME, 2003a), and could thus make CCS a realistic option for the country. They argue, however, that the technology brings few or even negative sustainable development benefits. In particular, introducing the technology would raise electricity prices, thereby endangering the affordability of energy services. On the other hand, CCS would involve technology transfer to South Africa.

Although there is thus a wide range of options to address the high CO<sub>2</sub> emissions in South Africa, Winkler and Marquard (2007) indicate that even if these options were fully exploited, CO<sub>2</sub> emissions would still be 30% higher than the 2000 level. Instead, they suggest that putting South Africa on a path towards a low-carbon society, more far reaching measures are needed including: 1) incentive programs for energy-intensive industries; 2) pricing energy to reflect external costs for non-energy-intensive sectors of the economy; 3) investment in climate-friendly technologies where the country has a resource (e.g. solar thermal technology); 4) measures to lower the energy intensity of key industries; and 5) economy-wide measures such as carbon taxes or emissions trading systems (Winkler & Marquard, 2007).

#### 6.6.2 CDM potential

Given South Africa's large dependence on coal and consequent high emission levels, there is considerable potential for emissions savings through the CDM. Furthermore, the investment climate is generally considered to be good, and the capacity for CDM implementation is in place (Jung, 2006). However, complicated approval procedures reduce South Africa's attractiveness. Furthermore, the low electricity price in the country forms a barrier for renewable energy and energy efficiency projects (BFAI, 2006).

Initially, South African stakeholders were sceptical of the use of the CDM, especially if the mechanism would not bring about sustainable development benefits (Kim, 2003). Nevertheless, CDM investors are increasingly finding their way to South Africa. On 1 May 2008, 13 projects had been registered with the CDM Executive Board, while 10 more projects were awaiting validation. However, this still represents only 0.7% of all projects in the CDM pipeline (Fenhann, 2007).

South Africa's strategic objectives for the CDM include: 1) serving as a lever for FDI-related employment creation in sectors that can achieve emissions reductions; 2) promoting policy initiatives aimed at emissions reductions; and 3) enabling technology transfer (Rosenberg, 2007). The increased use of sectoral CDM in the country could potentially facilitate greater investments in energy efficiency projects in the residential, transport, commercial, and industrial sectors (Rosenberg, 2007).

#### 6.6.3 International cooperation

In addition to the CDM, international cooperation could provide opportunities for South African climate policy in three respects (Winkler & Marquard, 2007):

1. *Finance*: Mainstreaming climate change into ODA, and the establishment of a Multilateral Technology Acquisition Fund could provide the necessary funding for low-carbon technologies. These funds could in turn leverage private investment as well;
2. *Technology transfer*: Through setting up a multilateral technology transfer facility, sensitive issues such as intellectual property rights, multilateral funding for technology development in developing countries, and international technology standards could be addressed. Such a facility could also build capacity for state and non-state actors involved working with low-carbon technologies, and could develop demonstration projects;
3. *Capacity building*: International cooperation could support the building of capacity with regard to climate policy-making, including training of experts in- and outside of government. For example, capacity building could provide support in preparing future National Communications (RSA, 2000).

## 6.7 Negotiation positions and strategies

Overall, South Africa's position in the climate negotiations is in line with that of the G77 and China. In the discussions and formal negotiations on a future framework, South Africa has indicated its preferences to some extent on issues of mitigation, adaptation, deforestation, the Clean Development Mechanism, and technology development. These positions are outlined below.

Regarding climate change mitigation, South Africa has been explicit in terms of both what can be expected from developing countries and with respect to the commitments that developed countries need to take on. Whereas the former is to be discussed under the Convention negotiation 'track', the latter needs to be addressed under the Protocol 'track'. South Africa posits that the outcomes of the Bali Action Plan represent a major step forwards for developing countries, going beyond what they had pledged to do before, although emphasizing that developing country mitigation actions need to be supported by technology and enabled by finance (UNFCCC, 2008). More importantly, however, the South African delegation has made it clear that "climate policy on its own will not solve the climate problem" (UNFCCC, 2006c: 2), and that the best approach to tackle the problem is by making development more sustainable and providing for positive incentives for developing countries.

In this context, South Africa has formally made a proposal to consider the inclusion of sustainable development policies and measures (SD-PAMs) in a future framework (UNFCCC, 2006b; 2006c). The concept of SD-PAMs, which emanates from the idea that climate change policies need to be integrated with sustainable development policies, has received significant attention in the climate policy literature in recent years (Winkler *et al.*, 2002; 2007a; 2008; Baumert & Winkler, 2005). The concept emphasizes the sustainable development co-benefits of greenhouse gas emission reduction policies. South Africa's main rationale for putting forward the proposal in the UNFCCC talks is to obtain recognition of action taken by developing countries (UNFCCC, 2006c). The SD-PAMs approach is related to the existing UNFCCC commitments of developing countries to formulate and implement measures to mitigate climate change (Article 4.1(b) UNFCCC). Under the approach, developing countries would pledge to effectively implement sustainable development policies. South Africa acknowledges, however, that the



SD-PAMs approach is in itself not sufficient to address the climate change problem (UNFCCC, 2006c).

While South Africa is thus actively tabling proposals on how developing countries could be integrated in a future climate regime, it has been adamant in its opposition of increasing flexibility with respect to developed country commitments. Generally, the country would like to see emissions reductions between 25% and 40% in 2020 compared to 1990 levels (IISD, 2007). The country has emphasized that “principles of equity, responsibility and capability” should guide the setting of commitments for developed countries (UNFCCC, 2007b). The importance of historical responsibility for greenhouse gas concentrations in the atmosphere also featured in other contributions to the process (e.g. IISD, 2006c).

Regarding adaptation, South Africa has indicated that even though it faces various climate change impacts, there is as of yet insufficient capacity to deal with these impacts (UNFCCC, 2007b). The country supports the generation of additional financial resources, including insurance, the Global Environment Facility, and innovative adaptation funding mechanisms (UNFCCC, 2007c; see also UNFCCC, 2006b), and the streamlining of these various funding sources (IISD, 2008).

As for the CDM, South Africa—like other African countries—has questioned the inequitable geographic distribution of CDM projects (IISD, 2006a). It has suggested exploring the opportunity to expand the CDM to programs and policies (UNFCCC, 2006b). Furthermore, it has expressed interest in searching for ways to include CCS into the mechanism (IISD, 2006c).

Finally, with regard to technology development, South Africa has urged the international community to adopt positive incentives that address questions of intellectual property rights and other barriers to the access to commercial clean technologies, including possibly ‘no-lose targets’ (UNFCCC, 2006b).

## 6.8 Summary

### 6.8.1 Perception of affectedness

Challenges abound in South African climate policy. The energy sector is faced with the Herculean task of reducing its greenhouse gas emissions, while at the same time improving affordable energy access to the poor and ensuring international competitiveness. In other words, development needs to be made sustainable. The difficulty is that South Africa’s economy, as it developed in the apartheid era, has been locked into a high level of dependency on fossil fuels, notably coal. Although options exist to address the high emissions from this energy source, these options will need to be consistent with objectives that are considered more important, such as economic growth, poverty alleviation, employment creation, and income inequality.

However, the South African government is aware that it cannot sit back and wait for other countries take action. Initial assessments of climate change impacts on the country indicate the potential severe effects on human health, water resources, food security, biodiversity, and subsequently on various sectors of the economy. Although a start has been made, the country does not have adequate capacity to adapt to these impacts.

### 6.8.2 Perception of justice and equity

South Africa sees itself as a developing country and is classified as such. This does not imply that the country is taking a defensive stance at the negotiations. Indeed, South Africa has been a strong supporter of the Kyoto Protocol's cap-and-trade approach, and has expressed its willingness to participate through non-legally binding commitments. This is most apparent in its explicit support of the SD-PAMs approach. South Africa shows that it is willing to take further action on the basis of differentiated responsibility. However, the flipside is that South Africa expects the richer nations to take on more ambitious targets, and provide additional technological and financial resources.

The conduct of international negotiations needs not only to be in line with the country's domestic development priorities, but should also conform to the priorities of South African foreign policy, which include a focus on Africa, South-South cooperation (especially with Brazil and India, but also with the G77 and China), and a commitment to rule-based multilateralism (Winkler & Marquard, 2007). South Africa's position will thus be influenced first by national priorities, then by regional concerns in Africa, then the priorities of the G77 and China, and finally global concerns (DEAT, 2004).

### 6.8.3 Perception of opportunity

The following statement perhaps best captures how South Africa perceives the opportunities of addressing climate change:

"South Africa needs to vigorously pursue the opportunities latent in the requirements that developed countries assist developing countries in their climate change response actions. This should be used as a vehicle to maximize the development benefits for South Africa, and the Southern African region as a whole, and to put in place suitable adaptation measures, ensuring a minimum of disruption while maximizing the return on any internal resources that are used" (DEAT, 2004: 4).

The number of opportunities perhaps equals the number of challenges for the country. The potential for energy efficiency in various sectors has barely been tapped, and the high emissions from coal provide several options for reducing South Africa's carbon footprint, including energy diversification and clean coal technologies.

Of course, a lot depends on the level of international cooperation, and how South Africa will manage to benefit from this. A number of options are available. The number of CDM projects, although slightly increasing, could still be significantly expanded, especially if some form of sectoral CDM is agreed upon as part of a post-2012 agreement. Furthermore, South Africa could benefit from mainstreaming efforts in the development aid policies of developed countries, establishing multilateral mechanisms for technology transfer, and enhanced capacity building.



## 7. Brazil in the Post-2012 Negotiations

### 7.1 Introduction

As the largest and most populous country in Latin America, Brazil is an important political and economic power in the wider region, a leader among developing countries, and an emerging world power. Brazil was a Portuguese colony from 1500 until its independence in 1822. Not least since Luiz Inácio Lula da Silva became president of Brazil in 2002, the country's foreign policy has strongly tended towards multilateralism, forging closer ties with other countries in the region, and engaging actively into diplomacy within the United Nations and the Organization of American States.

This chapter first sketches out key elements in Brazil's socio-economic and energy profile that shape its position in the post-2012 climate debate. Next, the effects climate change may have on the country are detailed followed by the country's international commitments with regard to climate change are summarized. We then present an overview of Brazil's evolving domestic climate policy. Finally, Brazil's strategy and views in the UNFCCC negotiations since 2005 are discussed, with a view to identifying possible leverage points in the coming negotiations, based on the country's perception on equity, opportunity and affectedness.

### 7.2 Country profile of Brazil

#### 7.2.1 Socio-economic profile

Brazil is among the ten largest economies in the world, and also a large agricultural producer. It has a diverse middle-income economy, with mature mining and manufacturing industries, including cement, aluminium, chemical products, oil and petro-chemical feed stocks. After a series of economic reforms in the 1990s, the country is today a net exporter.

The most important sector in Brazil is the services industry, accounting for 55% of GDP, followed by 37% from industry and only 8% from agriculture (Brazil, 2004). Despite a growth of per capita GDP by 13% during the 1990s, parts of the population, over 80% of which live in cities, are still poverty-stricken (almost 30% of the population survives at less than US\$ 2 per day), and regional disparities are considerable. Therefore, economic development, improving health care, and narrowing of the growing social gap in Brazil remain key priorities for each government, implying that environmental and climate policies will always be judged in terms of their social co-benefits.

*Table 7.1 Overview of selected socio-economic indicators for Brazil.*

Population	186.8
Population growth rate 1975-2005 & 2005-2015	1.8; 1.2
GDP 2005	796.1
GDP per capita 2005	8,402 (PPP)
GDP growth rate	
Human development index 2005 (# and ranking)	0.800, rank 70
Human poverty index	9.7%, rank 23
Population below 2 USD and 1 USD a day 1990-2005 (%)	Below 1 USD: 7.5%; Below 2 USD: 21.2%
People without electricity	Electrification rate 97%; 6.5 million without electricity
Imports of goods and services (2005) % of GDP	12%
Exports of goods and services (2005) % of GDP	17%
ODA received in mln USD 2005	191.9
Net FDI inflows % of GDP 2005	0.2

### 7.2.2 Energy and environment profile

*Table 7.2 Overview of selected energy and environment indicators for Brazil.*

Electricity consumption per capita 2004 kWh	2,340
Population without electricity 2005	Electrification rate 97%; 6.5 million without electricity (duplication with above)
Forest area % of total land area 2005	57.2%
Forest area average annual change 1990-2005	- 0.5%
Total primary energy supply (TPES) 2005	209.5
CO <sub>2</sub> emissions 2004	346.2 (excluding LULUCF)
CO <sub>2</sub> per capita	1.9
% of world total	1.16%

Given its size, it is not surprising that Brazil was ranked as the 19<sup>th</sup> largest greenhouse gas emitter in 2004 (and moves forward to rank 5 when emissions from land-use change and forestry are included). The latter shows the peculiarity of Brazil's emissions profile – low emissions per capita and per unit of GDP thanks to a relatively clean energy matrix, but massive emissions resulting from land-use change and forestry making up close to 60% of the national greenhouse gas emissions. Last but not least, emissions from agriculture, more specifically enteric fermentation due to cattle farming, are also considerable.

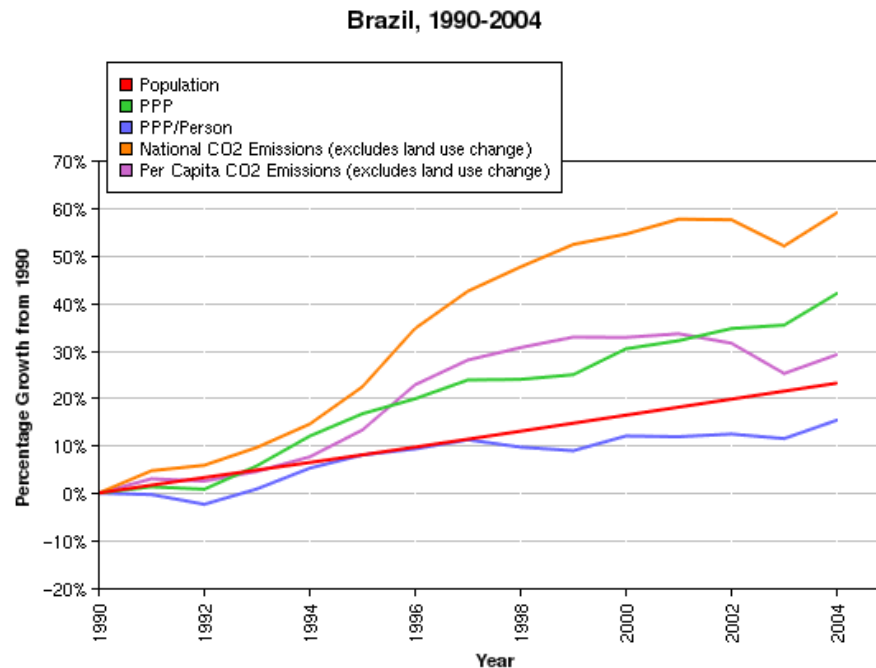


Figure 7.1 Development of Emission trends for Brazil 1990-2004 (Source: WRI, 2008).

Energy-related emissions in Brazil are relatively low due to large-scale use of renewable resources, particularly hydro and biomass. Over 90% of the country's electricity is based on hydropower, and renewable energy contributes roughly 15% to the overall energy mix (Brazil, 2004, see Figure 7.2). However, Brazil's energy base will get dirtier over the years to come as energy demand is growing fast (and more quickly than primary energy production and the national economy) (Chandler *et al.*, 2007). This gap will in the near future likely be covered through an increasing reliance on natural gas, with a resulting growth in greenhouse gas emissions (*ibid.*).

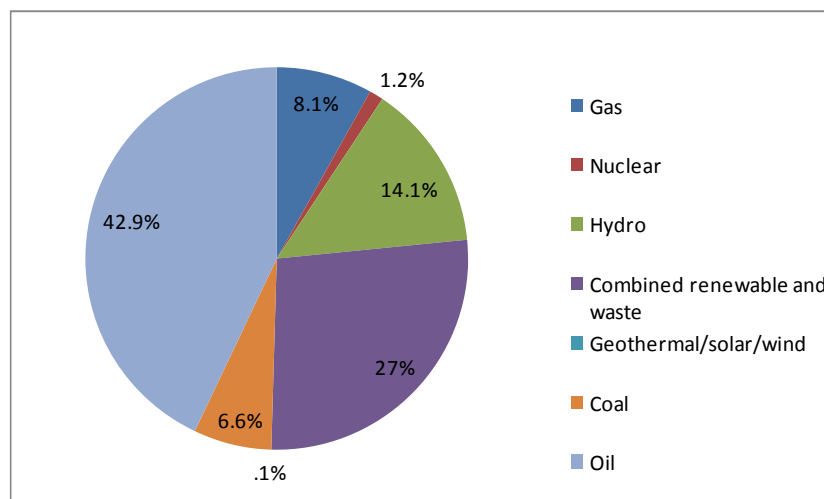


Figure 7.2 Brazil's Total Primary Energy Supply (TPES) in 2004 (based on IEA, 2007).

As mentioned above, Brazil's primary source of emissions is deforestation, in particular from the Amazon area, a key carbon sink for the global climate system. As Brazil's National Communication to the UNFCCC states, 96% of its emissions from land-use change and forestry can be "attributed to forest conversion" (Brazil, 2004)—plainly speaking, deforestation to gain land for cattle ranching and for soybean cultivation. In total, more than 690,000 square kilometres of rain forest have been lost this way, leading to yearly CO<sub>2</sub> emission of 200 million tons or higher (Volpi, 2007).

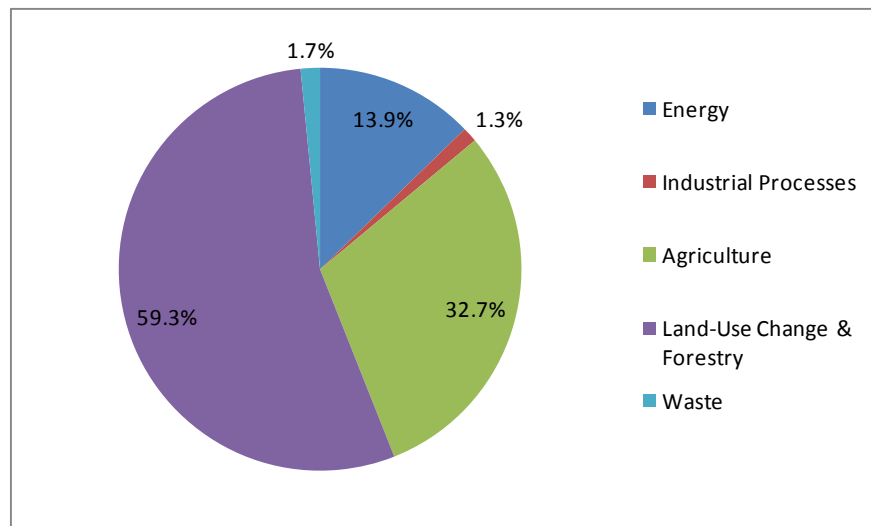


Figure 7.3 Greenhouse gas emissions in 2000 according to sector (based on WRI, 2008).

### 7.3 Affectedness: Physical and social vulnerability

On the basis of the latest IPCC report on impacts and vulnerability to climate change and a series of studies conducted by the INPE institute, the country can expect major negative, and little to no positive impacts from climate change on its territory (Magrin *et al.*, 2007; Marengo *et al.*, 2007). The most affected regions will be the semi-arid north-east of the country as well as the Amazon. As the IPCC report states, "replacement of tropical forest by savannas is expected in eastern Amazonia [ . . . ], along with replacement of semi-arid vegetation by arid vegetation in parts of north-east Brazil [ . . . ]" (Magrin *et al.*, 2007). The resulting higher temperatures in the Amazon as well as shifts in evaporation system will no doubt put considerable stress on its complex ecosystems. The social consequences are likely to be worst in the north-east, which displays some of the highest poverty levels in all of Brazil. From a health perspective, a hotter and more humid climate will also lead to increasing numbers and geographic spreading of vector borne diseases, such as malaria, yellow fever, dengue fever and encephalitis (Marengo *et al.*, 2007).

From an economic point of view, none of Brazil's key crops are expected to benefit from a changed climate. Soy in particular is likely to suffer from heat spells and dry periods (Marengo *et al.*, 2007). Reductions in river flows may also impact Brazil's hydropower production, which generates over three quarters of the country's electricity (Magrin *et al.*, 2007). Finally, sea-level rise due to climate change implies major risks for Brazil's coastal infrastructures and cities, where about a quarter of its population lives (*ibid.*).

Overall, despite the recent large-scale national effort to better assess Brazil's vulnerabilities to climate change, researchers have major uncertainties, mainly due to a lack of reliable long-term projections of the country's possible future climates at a sufficiently high spatial resolution (Brazil, 2004). Workable climate systems data still seem to be lacking for large sections of the country, including Amazonia (Marengo *et al.*, 2007). As this is not a problem specific to Brazil, but applicable to large parts of the developing world, committing major funds and large-scale international research collaboration to better assess regional impacts of climate change in the South may be a valuable bargaining chip in the post-2012 negotiations.

Moving from impacts and vulnerabilities to the perception of the climate problem in Brazil, and environmental awareness more broadly, the degree of social mobilization, also on environmental issues, is generally high in Brazil. Already at the time of the Rio Earth Summit, a survey counted as many as 1,533 environmental NGOs in the country (Ecolista, 1996).

On the climate front, public opinion and media coverage overwhelmingly support action against climate change, as evidenced by a recent poll of the BBC World Service of 22,000 persons in 21 countries. 78% of respondents in Brazil said that they had heard of or read about climate change, and 76% were convinced that the issue requires "major steps starting very soon" (BBC World Service, 2007). Interestingly, 63% even supported emission caps for less wealthy countries – a more progressive stance than the Brazilian government! However, as Born *et al.* (2005) point out, while interest in the subject is significant in Brazil, its position in the post-2012 negotiations, e.g. what kind of targets the country could or should accept, is hardly discussed in detail publicly (*ibid.*).

Concern about climate change in Brazil is closely linked to the worries of many Brazilians about the Amazon, an issue close to the nation's heart. Given the largely urbanized population, most support decisive action and better law enforcement against deforestation; the key challenge lies therefore essentially in overcoming the opposition of influential lobbies in the Brazilian congress and policy circles (Viola, 2008).

## 7.4 Institutional context

### 7.4.1 Participation in international institutions

As the host of the Rio Earth Summit in 1992, Brazil was among the first countries to sign the UNFCCC, ratifying it two years later in 1994. Brazil also ratified the Kyoto Protocol unusually quickly, compared to the traditional pace for international ratifications (Viola, 2008), to ensure its entry into force in 2002 (eventually delayed until Russia's ratification in 2005).

Brazil is also involved in other international climate initiatives outside the UNFCCC, including the G8+5 group, the Major Economies Meeting and the Methane for Markets partnership. With the booming interest in biofuels, Brazil is also increasingly committing to international partnerships and cooperation in this field, including the International Biofuels Forum, the US-Brazil Ethanol Partnership, and a regular Energy Policy Dialogue between the EU and Brazil.



Despite its involvement in such a multitude of climate-related fora, Brazil has continuously emphasized the primacy of the UNFCCC as the key multilateral platform to address climate change, as evidenced by President Lula da Silva's statement when President Bush's plans for the Major Economies Initiative first emerged: "The Brazilian position is clear cut. I cannot accept the idea that we have to build another group to discuss the same issues that we addressed in Kyoto and not fulfilled" (The Guardian, 2007).

The Ministry for External Relations (MRE) leads the Brazilian delegation in international negotiations on climate change, working together with the Ministry of Science and Technology (MCT) and the Ministry of the Environment (MMA). Viola (2008) regrets that this 'diplomatic mindset' in the driving seat often leads to less ambitious or innovative negotiation positions than would be possible under the lead of the MMA.

It is also worth noting that the Brazilian NGO forum has a designated representative that attends the UNFCCC meetings as a member of the Brazilian delegation and is also represented in the government-led Brazilian Forum on Climate Change.

#### 7.4.2 Domestic climate policies

Responsibility for domestic climate policy in Brazil is shared between the MCT and the MMA, with lead responsibility in many cases attributed to the former. In 2000, a "Brazilian Forum on Climate Change" was established. The committee is presided over by President Lula and encompasses 12 ministers as well as representatives of scientific and non-governmental organizations. It was supposed to be a key tool to support the mainstreaming of climate issues in all policy fields, yet so far seems to have done little else than public meetings at universities (Born *et al.*, 2005).

At the sub-national level, local governments of the cities of Rio de Janeiro, Curitiba and others are active in the international network Cities for Climate Protection. Other states are actively pursuing regional initiatives in the fields of both mitigation and adaptation.

Brazil's domestic efforts with regard to climate change show a "dual face" (Paredis *et al.*, 2006): while the country is an environmental leader among developing countries with regard to emission reductions in the energy sector, its record in the crucial challenge of reducing deforestation in the Amazon is, despite some recent progress, still bleak. The measures in the energy sector were mostly adopted not on climate grounds, but for other reasons, such as concerns over energy security, employment generation or reduction of local air pollution. However, they "cut investment requirements in the energy sector, reduced net energy imports and improved the balance of trade, enhanced energy efficiency, expanded renewable energy use, and ushered in several positive social and environmental changes." (Chandler *et al.*, 2002)

Brazil's flagship policy in the climate field is its automotive ethanol program PRO-ALCOOL, launched in the 1970s in response to the oil price shocks and the tumbling international sugar prices. The program is the world's largest commercial application of biomass for energy production. A by-product of the sugarcane used to produce ethanol, bagasse, is being widely used for renewable cogeneration of electricity. Both biomass fuels are estimated to have reduced Brazil's CO<sub>2</sub> emissions by 7% in the year 2000 (ibid).

Policies to curb emissions on the demand-side through energy conservation and efficiency in the transport and electricity sector have also been successful. The PROCEL program, for example, running since 1985 has aimed at reducing the waste of electricity of both supply and demand, has resulted in emission reductions (La Rovere, 2002).

One of the most recent actions by the government is the 2004 Biodiesel initiative (PRO-BIODIESEL), which is linked to social inclusion and regional development programs. The program requires all diesel sold in Brazil to contain at least 2% biodiesel by 2008, and 5% from 2013.

Brazil's policies in the land-use sector have long been stymied by weak law enforcement, unsecured land tenure, and counter-productive incentives such as subsidized credits for soybean cultivation and cattle ranching (Volpi, 2007). A 2004 Action Plan for Preventing and Controlling Deforestation, integrating the work of 15 separate ministries, was supposed to give much needed impetus here. Sub-level initiatives have equally flourished, with the states Amazonas and Mato Grosso introducing models for compensation for "environmental services" and increasing parts of the Amazon being put under protection. The efforts initially seemed to bear fruit; the state of Mato Grosso reported a reduction in the deforestation rate by nearly 40% in the first two years since the national plan came into existence (INPE, 2007). While other factors have certainly contributed to this trend, experts also emphasize the impact of increased government control and better enforcement of policies (Moutinho, 2007). Yet with the recent soaring of food prices around the globe, this trend seems to have reversed dramatically (BBC, 2008) and the struggle to address this key problem on Brazil's, and in fact the world's mitigation agenda appears far from resolved. The role of forests and deforestation in the future climate regime is therefore, not surprisingly, at the heart of Brazil's post-2012 negotiating position.

## 7.5 Justice and Equity: Framing of the problem

Brazilian policy-makers are well aware of the seriousness of climate change. President Lula referred to global warming as the single most important issue on the global agenda, even before international trade (The Guardian, 2007). Brazil sides with the rest of the developing countries in attributing responsibility for climate change to the industrialized countries thus deriving a "you mitigate and we follow" logic. The country's domestic emissions profile, at least on the energy side, provides ample justification for this position. Thanks to the measures taken to boost renewables, particularly hydropower, and biofuels since the 1970s, Brazil still has very low per capita emissions and low carbon intensity, despite rising overall emissions trends. With considerable parts of the population still living in poverty, poverty eradication and economic development remain an overriding political imperative in the country, which at time eclipses more distant long-term threats such as climate change in day-to-day policy-making.

Finally, regarding the Amazon, with regard to which at least the urbanized parts of the Brazilian population may acknowledge their country's role not only as a victim of climate change, but as a 'carbon perpetrator', the Brazilian government becomes very tight-lipped. In a one page special contribution to the most recent Human Development Report on Brazil's role in climate change, President Lula refers to the Amazon only in a last, short paragraph:

“Finally, a brief comment on rainforests. The Amazon region is a treasured national resource. We recognize that this resource has to be managed sustainably. That is why we introduced in 2004 an Action Plan for Preventing and Controlling Deforestation in the Amazon. [...] The decline since 2004 in the rate of deforestation recorded in states such as Mato Grosso demonstrates that it is possible to reconcile economic growth with sustainable environmental management.” (UNDP, 2007)

This attitude, the deep suspicions of outside involvement in the management of the Amazon, is symptomatic also for Brazil's longstanding position regarding the treatment of forests under the global climate regime.

## 7.6 Opportunities in addressing climate change

Climate change, despite the adverse consequences projected for Brazil as discussed above, nevertheless presents the country with significant political and economic opportunities.

### 7.6.1 New policies and technologies

With concerns over energy security becoming ever more salient around the globe, Brazil's long-standing frontrunner position in the production and use of biofuels makes it a much sought-after cooperation partner. This concerns not only the potential for the exchange of scientific, technological and policy know-how, but also, even more importantly, the major export opportunities arising from it. Exports of ethanol currently amounting to over three billion litres per year could see a threefold increase over the next decade (Allianz, 2007).

### 7.6.2 CDM potential

Next to biofuels, CDM, whose last-minute inclusion in the Kyoto Protocol goes back to a proposal by the Brazilian delegation, has great potential in Brazil. The country was a relatively early mover in the carbon market and has since consolidated its leading position, together with China and India. By the end of April, 131 CDM projects in Brazil had been registered by the Executive Board, making up a share of more than 10% in the global CDM market. Brazilian policy-makers are very enthusiastic about the CDM, “a cooperation instrument that is both brilliant and innovative” according to Brazil's statement in the Seminar for Governmental Experts in Bonn in 2005 (UNFCCC, 2005). They see the mechanism's potential in both technology transfer and “even, more important, in supporting the development of local technologies” (ibid).

With its general attractiveness for FDI flows, not least because of its stable institutional context and investment climate, Brazil looks set to benefit equally from any future market mechanism. Outside of the forest sector, project types related to energy efficiency and fuel substitution in the energy sector, or those aiming at process change, energy efficiency and fuel substitution in industries such as aluminium, cement, chemical, ferroalloys, iron and steel, pulp and paper are seen as particularly promising (UNIDO, 2003).

### 7.6.3 Reducing emissions from deforestation (REDD)

Even if this may not yet have been completely recognized by Brazilian climate negotiators, potentially the greatest ‘opportunity’ for Brazil is the Amazon and the need to preserve it as one of the world’s most important carbon sinks (Allianz, 2007). No matter what shape a REDD mechanism in a post-2012 climate agreement eventually takes, Brazil would most likely be one of the main beneficiaries and such an instrument could trigger financial transfers of a totally different scale than exports of biofuels or CDM investments. Currently, key authorities in the Brazilian climate debate are still very sceptical about how a REDD mechanism could be designed and implemented in a credible manner that maintains its environmental integrity (Neeff, 2008). Yet provided the Brazilian authorities come around to the idea and secure credible commitments by key stakeholders for far-reaching steps to halt deforestation, a REDD mechanism could be key to providing the capital needed for changing the incentive structure in such a way that forest conservation becomes more profitable than land clearing for ranching or agriculture.

### 7.6.4 International cooperation and foreign policy

Finally, thinking about possible ‘grand bargains’ outside the climate realm to convince Brazil to join a post-2012 agreement, two issues come to mind. The first is the Doha round, where President Lula has positioned himself as one of the key voices of developing countries. Progress in this round of trade negotiations, which started in 2001, has stalled over a range of issues, including agriculture, intellectual property rights, and access to developing country markets. Further issue linkages between the already complex climate and trade realms may not facilitate things in either forum. Yet well-targeted and timely concessions by the EU (and the US), for example on cutbacks of agricultural subsidies, could be potential levers to secure Brazil’s commitment to ambitious post-2012 action.

Secondly, a seat in the UN Security Council has long been one of the Brazil’s key aspirations in its foreign policy. Even though UN reform currently seems a distant prospect after the failure of the 60<sup>th</sup> Anniversary UN General Assembly in 2005, this could change in the future – and progress on the issue of Security Council membership would undoubtedly be a powerful argument to force progress also in the UNFCCC arena.

## 7.7 Negotiation positions and strategies

Brazil has been actively involved in the UNFCCC negotiations since the 1990s. Its submission in 1997, later labelled the “Brazilian proposal”, which sought to attribute mitigation burdens based on a country’s accumulated emissions since the industrial revolution, has been on the COP agenda for years. Yet, while garnering the support of most developing countries, it has failed to convince industrialized countries (Viola, 2008).

With regard to the post-2012 debate and the questions surrounding mitigation commitments for developing countries, Brazil’s position has evolved over the last few years. At the Bonn Seminar for Governmental Experts in spring 2005, Brazil’s position was still unambiguous: "Efforts undertaken by developing countries to reduce emissions in different sectors within their territories can only be characterized as voluntary and, therefore, cannot be linked or associated with goals, targets or timeframes," (UNFCCC, 2005a).

Since then, it has moved away from this very principled stance. While the principle of common but differentiated responsibilities is still at the core of its negotiating position, a Brazilian delegate signalled room for compromise at an informal debate in 2007: “I would like however, to underline that this principle [the principle of common but differentiated responsibilities] does not exempt any party of its responsibilities. In this sense, the effort to combat climate change must be a global one” (Machado, 2007). Paula Capobianco, executive secretary at the Brazilian Environment Ministry, went even further, saying that “Brazil would not be unwilling to accept targets, if the principle of common but differentiated responsibility were respected—that is, if countries historically responsible for emissions stepped up their contribution to mitigating global warming” (quoted in IPS, 2007). This change in position is, according to Viola (2008), the result of “both domestic and international dynamics”, as the country’s categorical refusal to accept targets had drawn heavy criticism from a range of societal actors in 2007 (Viola, 2008). Emphasizing that “discussions disconnected from effective negotiations cannot prosper”, Brazil was also supportive to transforming the “Long-term Dialogue on Cooperative Action” under the UNFCCC into a formal negotiation setting—one of the successes of the Bali summit (IISD, 2007a).

At the Bangkok climate talks in early 2008, Brazil further elaborated on its position with regard to differentiated post-2012 commitments for developing and developed countries. While the latter should be obliged to cut back emissions under a future climate regime, it should be the task of the former to limit their emissions growth (IISD, 2008). Furthermore, and importantly, Brazil (along with China and others) demands that monitoring, reporting and verification of the mitigation actions that developing countries may be committing to should occur nationally (implying that these countries would report policies adopted and emission trends without being exposed to further scrutiny at the international level) (ibid). Finally, any commitments by developing countries should be linked to “international incentives [...] and the recognition of existing actions” (ibid).

Another topic, on which Brazil regularly speaks up during the international climate negotiations, is, not surprisingly, the role of forests in the climate regime. The country has long adopted a very defensive line on this issue, which led it to reject the inclusion of the whole carbon cycle into the Kyoto Protocol (Viola, 2008). The government feared that such a provision could provide the basis for a country being held accountable for its high deforestation rates under a future climate regime that includes commitments for emerging economies (ibid). These concerns over a possible loss of sovereignty over the Amazon have also prompted the Brazilian delegation to oppose the development of market-based instruments under the UNFCCC to compensate for “avoided deforestation”.

Given this history, the written submission by Brazil at the Montreal COP in 2005 can be considered a major shift in position. According to Viola (2008), the initiative was preceded by major internal debate between the Brazilian Environment Ministry which supported the proposal and the Ministry for External Relations, which is leading the Brazilian delegation at the climate negotiations and which was more reluctant to tackle this issue head-on (Viola, 2008). The proposal called for the creation of an international fund fed from voluntary contributions by industrialized countries that would reward efforts to reduce deforestation rates in developing countries based on average historical baselines (UNFCCC, 2006a). Brazilian delegates have since reiterated the proposal and expanded upon its details at subsequent international meetings.

However, the Brazilian position on this issue remains vague. At the Bali summit, Brazil rejected the consideration of conservation and enhancement of forest carbon stocks in the context of REDD negotiations (IISD, 2007b), casting doubt over its overall strategy on this issue. This might be due to an internal split within the Brazilian delegation, which prevents the country from adopting a clear position, also against the background of powerful domestic lobbies that are economically benefiting from deforestation.

Moving on to Brazil's standpoint on CDM in the context of a post-2012 regime, its attitude is characterized by an emphasis on the environmental integrity of the mechanism and reluctance to risk damaging the functioning of the market through experimentation. Brazil opposes the inclusion of carbon capture and storage under the CDM, fearing the technology's impact on the current CDM portfolio that might lead to a 'crowding out' of other project types (IISD, 2006). While it supports the continued existence of the CDM after 2012, Brazil nevertheless cautions, also in line with its stance on forests under the UNFCCC that "market mechanisms are part of an effective response, but are not the only answer. Climate protection is by far too important to be left solely in the hands of the market" (Vargas, 2007).

Finally, on the issue of technology, Brazil's stance appears rather little distinct from other developing country positions. In Bangkok, it emphasized considering not only new technologies, but also ways to disseminate and use existing ones and to explore ways to stimulate technological research in developing countries (IISD, 2008). It called for the development of innovative financial instruments, possibly in cooperation with the international financial institutions, for purchase and cheap licensing of technologies to developing countries (Vargas, 2007). Finally, it attributes high importance to the strengthening of South-South cooperation on technologies, without going into further specifics how exactly this could be achieved (Lula, 2007).

## 7.8 Summary

With respect to the case of Brazil, it is clear that the three aspects of perception—affectedness, justice and equity, and opportunity—should primarily be looked at as complementary rather than competitive. At the same time, however, it seems that the perception of justice still outweighs the perception of opportunity in driving Brazil's negotiating strategy. Looking at the potential benefits for the country arising from an inclusion of forests into the Kyoto framework, its hesitance to bind itself in this area appears not entirely rational. This is all the more striking given the relatively strong domestic perception of affectedness: an inclusion of forests into the Kyoto regime would not only carry material benefits, but also credibly bind the government domestically and thereby strengthen its position vis-à-vis those with vested interests in deforesting Amazonia.

### 7.8.1 Perception of affectedness

The Brazilian government and a large part of its population regard climate change as a serious threat. Public opinion polls, active media and a high degree of social mobilization testify to this fact, which is stronger than one might expect for a developing country with many other pressing concerns. Yet this is vindicated by the likely effects of global warming. Impacts of climate change are projected to be severe for the country, ranging

from major losses of biodiversity in the Amazon region, droughts in the North East, decreasing crop yields to an accelerated spread of tropical diseases.

Thus, given the interest of the Brazilian public on this issue, the self-perception as a regional leader and important spokesperson for developing countries, and the strong multi-lateral orientation of Brazil's foreign policy more generally, pressure on the Brazilian policy-makers to contribute to and actively shape a post-2012 agreement is undoubtedly strong.

### 7.8.2 Perception of justice and equity

As a developing country, Brazil sides with the G77 and China in its general framing of climate change. Attributing historical responsibility for the problem to the industrialized world, it emphasizes that any future agreement must be based on the principle of common but differentiated responsibilities, and that it would have to include 'positive incentives' for developing countries. Its own record in decarbonising the country's energy matrix provides it with additional arguments to demand decisive action from developed countries before committing itself to potentially costly policies. Brazil is particularly sensitive about its sovereignty being impaired through international involvement in the management of the Amazon, which it considers a vital national resource. This explains its categorical opposition to a market-based mechanism and the refusal to let developed nations 'buy themselves out' of their responsibilities through cheap forestry carbon credits under a REDD mechanism.

### 7.8.3 Perception of opportunity

Given the potential gains Brazil stands to win from a well designed post-2012 agreement, its perception of opportunity is relatively weak, compared to the other two dimensions. It certainly realizes the opportunities arising from its frontrunner role in biofuels production and use, and acknowledges the potential technological and financial benefits as a mature and stable host for CDM projects. Yet, to date, it seems to have perceived its rainforest more as a liability than an opportunity in the international climate negotiations, ignoring the substantial financial flows—and internal political impetus and support for effectively combating deforestation—that a REDD mechanism could provide. This is a point which European negotiators might want to stress more in future interactions with Brazil, perhaps in conjunction with the active domestic audiences that support decisive action on climate change and on halting deforestation.

## 8. The Russian Federation in the Post-2012 Negotiations

### 8.1 Introduction

The significance of the Russian Federation in regard to mitigating climate change through the international climate regime is recognized worldwide. The Russian Federation played a crucial role in the ratification of the Kyoto Protocol after the withdrawal of the United States. With its 5.3% of global GHG emissions, Russia's participation was a precondition for the agreement to become legally binding (Perelet *et al.*, 2007). In April 2002, the Russian government began the ratification process however it delayed actual implementation of the Protocol until 2004 (at the urging of the EU). During the intervening period between 2002 and 2004 the behaviour of Russia in the climate negotiations was characterized by a number of contradictory signals, ranging from support to indifference (Buchner & Dall'Olio, 2005; Avdeeva, 2005)

How can the contradictory negotiation position of Russia be explained? What were the motives for the delay in ratification and the quick turnaround? What are the factors shaping the negotiation behaviour of the Russian Federation in the recent post-2012 negotiations? The focus in this chapter is on the differences and similarities between the actual and perceived affectedness, equity and opportunity. We first provide a country profile with the help of key socio-economic indicators and data on energy and GHG emissions. Second, we assess the actual affectedness, the domestic framing of the issue and the actual opportunities for climate change mitigation. Third, we give an overview of the institutional context; the country's international and domestic commitments on climate change and energy. Fourth, we examine the recent negotiation strategies and positions of the Russian Federation. Concluding, we will summarize the similarities and differences between the country's actual and perceived affectedness, equity and opportunity.

### 8.2 Country profile of the Russian Federation

#### 8.2.1 Socio-economic profile

Russia's population is estimated at around 144 million people and is distributed rather unevenly: the majority, 73% live in urban environments in the European/western portion of the country. While the average population density is estimated at 9 inhabitants per km<sup>2</sup>, these densities range from 328 inhabitants per km<sup>2</sup> in Moscow to 1.2 inhabitants per km<sup>2</sup> in far eastern Siberia (UNFCCC, 2004). The country has a very low population growth rate with even negative projections for the period 2005-2015.

Following the end of the communist regime in 1991, the country experienced a severe economic decline characterized by high unemployment and large scale migration. In the period 1989-1998, GDP fell by 46%. In the period between 1998 and 2002 the economy boomed, peaking in 2000 at a 9% GDP growth, falling back to 4.3% in 2002 (UNFCCC, 2004). The GDP growth rate in the period 1990-2005 of -0.1 % shows that the current GDP is approaching but has not yet reached the 1990 level.



Russia is a developed country with a per capita GDP of US\$ 5,336 or US\$ 10,846 PPP, a high ranking of 67 on the human development index, but a low ranking compared to other Annex I countries. In comparison to 1990, the imports and exports of goods and services as a percentage of GDP have increased from 18% to 22% and 18% to 35% respectively. However, despite the recent economic growth, 45.3% of the population lives on less than US\$ 4 a day.

*Table 8.1 Socio-economic indicators.*

Population 2005	144.0 mln
Annual population growth rate	0.2 (1975-2005)
	-0.5 (2005-2015) *1
Urban population (% of total) *3	66.9 % (1975)
	73.2 % (2005)
	72.6 % (2015) *1
GDP 2005	763.7 (US\$ billions)
	1,552.0 (PPP US\$ billions)
GDP per capita 2005	5,336 (US\$)
	10,845 (PPP US\$)
GDP growth rate (%)	-0.7 % (1975-2005) *4
	-0.1 % (1990-2005) *4
Human development index 2005 (# and ranking)	0.802 (ranked 67, high human development)
Population below 4 USD a day 2000-2004 (%)	45.3 %
*2	
Imports of goods and services (% of GDP)	22 % (2005)
	18 % (1990)
Exports of goods and services (% of GDP)	35 % (2005)
	18 % (1990)

*Source: UNDP (2007).*

\*1 Data refer to medium-variant projections.

\*2 Data refer to the most recent year available during the period specified.

\*3 Because data are based on national definitions of what constitutes a city or metropolitan area, cross-country comparisons should be made with caution.

\*4 Data refer to a period shorter than that specified.

### 8.2.2 Energy and environment profile

Russia compared to other countries is the third largest emitter of GHGs; after the United States and China. Despite an increase in GHG emissions due to the recent economic growth, their share in world GHG emissions is not predicted to change significantly in the near future (Perelet *et al.*, 2007). The IEA projects that India's share in global GHG emissions might surpass Russia in about 15 years. Figure 8.1 depicts the projection of the emissions without mitigation of major countries.

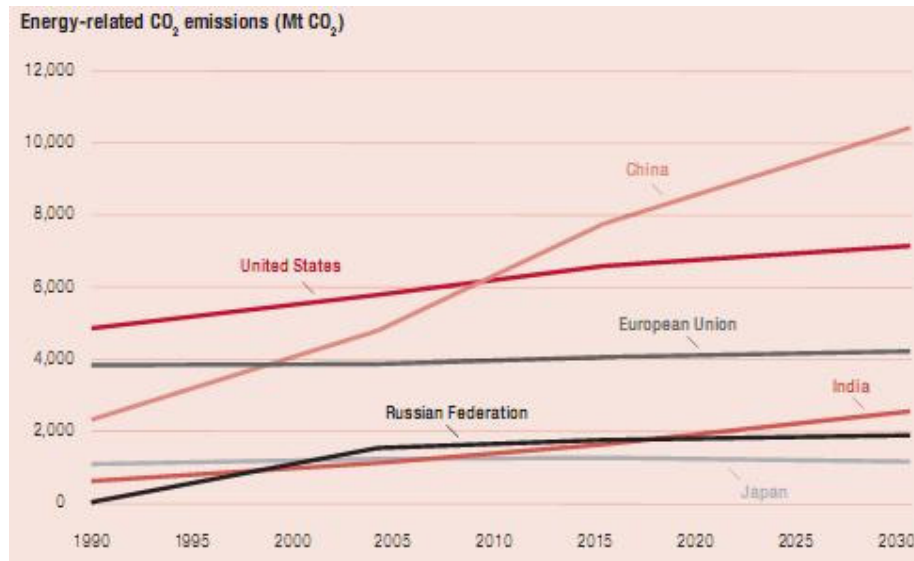


Figure 8.1 Business-as-usual CO<sub>2</sub> emissions on a rising trend. Source: IEA (2006) in UNDP (2007).

On a per capita basis the Russian emission rates are average for industrialized countries with low efficiency. Its emissions per capita are between world average and Annex I average (Höhne *et al.*, 2007). In the period 1992-2004 the CO<sub>2</sub> emission per capita decreased annually by 1.9% due to the economic crisis in the 1990s. The main driver of Russian emissions is the intensive use of gas for its economy, as expressed in the carbon intensity of growth. Russia's carbon intensity exceeds leading European countries by 3.8 times, the USA by 2.4 and the OECD countries by 2.6 times. As compared to other transition economies and developed countries joining the Kyoto Protocol, only Ukraine was more carbon intensive than Russia (Perelet *et al.*, 2007).

The energy sector plays an important role in Russia's economy, accounting for 28% of its GDP. It is estimated that one-third of the world's gas reserves and the world's second-largest remaining reserves of crude oil are within their territory. Russia's increasing dependence on gas (now 53.9% of TPES) is an important factor contributing to its GHG emissions (see Figure 8.2). The majority of GHG emissions stem from electricity generation and heating (see Figure 8.3). In contrast with OECD-countries the sectoral breakdown of the total final consumption of energy has a much higher share in the residential sector and a much lower share for transport (UNFCCC, 2004).

Table 8.2 Energy and environment indicators.

Electricity consumption per capita in kWh	6,425 (2004)
Forest area % of total land area	47.9 % (2005)
Forest area average annual change 1990-2005	0.0 (% annual change)
Total primary energy supply (TPES) 2005 (Mt of oil equivalent) *1	646.7 (2005) 878.3 (1990)
CO <sub>2</sub> emissions 2004 (Mt CO <sub>2</sub> )	1,524.1 (2004) 1,984.1 (1990) *2 -1.9 (% annual change) *3
CO <sub>2</sub> per capita (t CO <sub>2</sub> )	10.6 (2004) 13.4 (1990) *2
% of world total	5.3 % (2004) 8.8 % (1990) *2
Carbon intensity of growth: CO <sub>2</sub> emissions per unit of GDP (kt of CO <sub>2</sub> per million 2000 PPP US\$)	1.17 (2004) (compare: OECD=0.45) 1.61 (1990) *2 (compare: OECD=0.54)

Source: UNDP (2007)

\*1 Total primary energy supply (TPES) is made up of 'indigenous production + imports – exports - international marine bunkers ± stock changes'. TPES is a measure of commercial energy consumption. In some instances, the sum of the shares by energy source may not sum up to 100% because pumped storage generation has not been deducted from hydroelectricity generation.

\*2 In cases where data for 1990 are not available, data for the closest year between 1991 and 1992 have been used.

\*3 Refers to the 1992-2004 period.

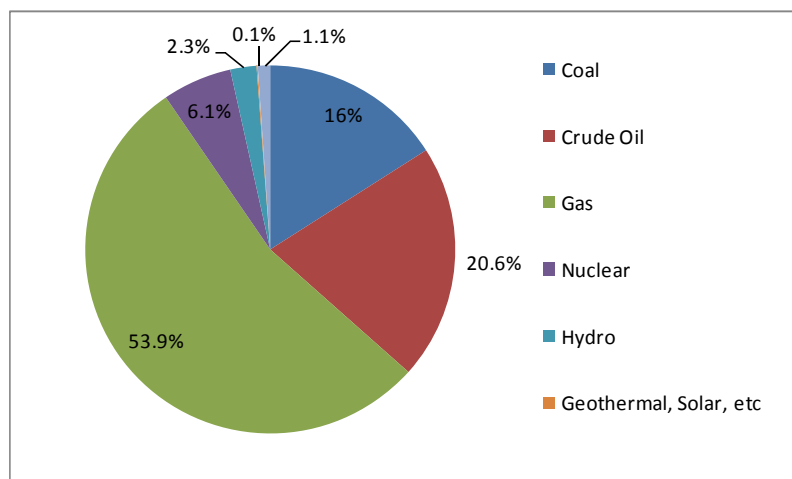


Figure 8.2 Russian Total Primary Energy Supply (TPES).

\* 1 by source in 2005 (Source: based on IEA, 2007).

\* 1 Share of TPES excludes electricity trade.

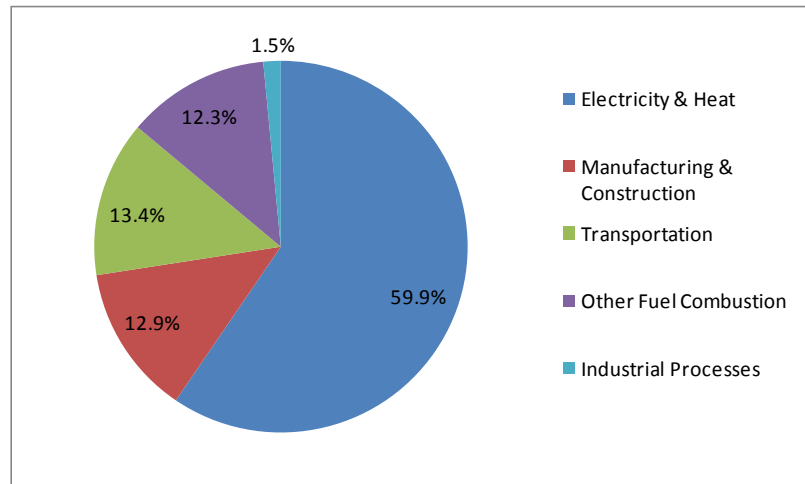


Figure 8.3 Russian GHG emissions by sector in 2004 (excludes land use change)  
(Source: based on WRI, 2008).

### 8.3 Affectedness: Physical and social vulnerability

Territorially Russia is the world's largest country, covering 13% of the Earth's surface. Roughly 67% of the land area is under permafrost. Stretching from the pre-Caspian deserts to the Arctic tundra the climate varies widely across the country. Winter temperatures can be as low as  $-51^{\circ}\text{C}$  in Siberia, while summer temperatures can be as high as  $30^{\circ}\text{C}$  in southern parts. Climate change therefore can have diverging long-term effects in the different ecosystems of the country (UNFCCC, 2004).

The Russian government commission IGCE conducted an assessment of Russia's physical vulnerability to climate change in 2002. The assessment focused in particular on four areas: the cryolite zone, agriculture, forestry and water resources. The cryolite zone comprises the upper layer of the Earth characterized by negative temperatures. It also encompasses the permafrost zone. In the cryolite zone, an annual increment of  $0.02^{\circ}\text{C}$  to  $0.06^{\circ}\text{C}$  in air temperature is observed. Such increases can shift the border of solid cryolite northwards by 200 km before the end of the century, resulting in major implications for existing infrastructure (UNFCCC, 2004). The overall balance of impacts on the agriculture is expected to be positive. A displacement of vegetation zones can be expected, with improvement of agricultural outputs in some areas and deterioration in others. However, assuming a doubling of  $\text{CO}_2$  concentrations, a 13% increase in productivity of forage crops and 11% increase in productivity of grain crops can be expected in the next 40-50 years. Assuming that global warming could increase net  $\text{CO}_2$  removals, Russia can expect a major impact on forests in the long term. However, these effects are not expected to be important in the European part of Russia within 50 years. Climate change impacts in the form of increased precipitation already influences water resources, such as the Volga River and the Caspian Sea. An increase of  $3-5^{\circ}\text{C}$  and an increase of precipitation of 10-20% can mean an increase in the annual water flow by 25-40% in the Volga and 15-20% in the Enisei river basin. Some other regions of Siberia may experience more dryness (UNFCCC, 2004). A fifth area of expected impacts is human health. A sharp increase in air temperature may bring negative consequences, such as increases in intestinal infectious diseases, insect and tick infections (Perelet *et al.*, 2007).

## 8.4 Institutional context

### 8.4.1 Participation in international institutions

Following the withdrawal of the United States from the Kyoto Protocol Russia, which accounted for 17.4% of 1990 emissions, became a key element to seeing that the Protocol came into force. After a considerable delay of two years the Russian Federation ratified the Protocol in November 2004. Classified as an Annex I Party, Russia is obliged to stabilize emissions at 1990 levels. Since 1990 is the benchmark year for emission limits and Russia experienced a severe industrial decline after the collapse of the Soviet Union, Russia has considerable room to increase emissions before 2012. Between 1990 and 2000 Russia's emissions fell by approximately 30% (Henry & McIntosh Sundstrom, 2007). Thus, Russia still has a surplus of unused emission allowances, which it could sell on the international emissions trading market. Despite economic growth, Russian GHG emissions in 2004 were still 33% below the Kyoto commitment. The Russian Federation can comply with the quantitative commitments without further domestic measures. Russia does however, experience difficulties in complying with the institutional criteria to be eligible to participate in the Kyoto mechanisms. The development of Russian compliance mechanisms was considerably slow until 2006. Previously, Joint Implementation (JI) projects were halted by a lack of required national guidelines. Also a domestic emissions trading will not be established prior to 2012 (Korppoo & Moe, 2007).

### 8.4.2 Domestic climate policies

The domestic Russian institutional basis for climate change mitigation was established with the creation of the Inter-Agency Commission on climate change problems (ICC) in 1994. This commission is charged with "coordinating the work of the domestic agencies; coordinating the implementation of the UNFCCC in Russia; organizing and coordinating the Russian participation in the official activities of the UNFCCC and international cooperation..." (Tangen *et al.*, 2002: 33). The Commission is chaired by the head of Russian Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet). In 1999, the more powerful Ministry of Economic Development and Trade (MEDT) became co-chair of the ICC. Several other ministries are involved in the process, *inter alia*, the Ministry of Energy, the Ministry of Natural Resources and the Ministry of Foreign Affairs. Since the pre-COP-6 discussion on the Russian national position in the international negotiations the State Duma has played an active role in climate change issues (Tangen *et al.*, 2002). Nevertheless, until the recent elections the executive branch under former President Putin (now Prime Minister) held considerable power within the political system. Thus while ratification of the Kyoto Protocol formally required the approval of the State Duma and Federation Council the final and critical decision was made by President Putin (Henry & McIntosh Sundstrom, 2007; Buchner & Dall'Olio, 2005).

There are currently only few national climate mitigation measures in place. In 2005, a National Action Plan for Kyoto implementation was developed, but it failed to include concrete emissions reduction targets. The plan consists of four principal areas: implementing policies aimed at reducing emissions and enhancing GHG absorption; the creation of a national system and inventory for the estimation of anthropogenic emissions by

source; elaboration of legislative and organizational backing of Russia's participation in the Kyoto flexible mechanisms; and measures to support Russia's international engagement in the climate regime (Avdeeva, 2005). The plan has distributed responsibilities across ministries and called for the creation of an interdepartmental commission led by the MEDT.

### 8.5 Justice and Equity: Framing of the problem

In general the issue of climate change is not regarded as being a serious environmental problem. To this end it is not uncommon to hear many arguments propounding the potential benefits that climate change could have on the country. Also many leading figures in the Russian scientific community and government institutions are known to be climate sceptics. For those who are indifferent or sceptical towards climate change, the climate regime is mainly perceived as a system for wealth redistribution. This behaviour corresponds with a common attitude in Russia that humankind is the 'ruler' rather than the 'carer' of nature (Korppoo & Moe, 2007).

### 8.6 Opportunities in climate change mitigation

The legacy of inefficient energy production, transportation and consumption infrastructure from the Soviet era offers great opportunities for climate change mitigation in the field of technology. There is a large potential for emissions reduction through hosting Joint Implementation (JI) projects and embarking on emission trading (Korppoo & Moe, 2007). Despite the large potential of JI and emission trading, these Kyoto mechanisms have not gained a strong support in Russia. The Russian Federation considers the benefits of the mechanisms to be insignificant and the rules overly bureaucratic. This attitude is further reinforced by the recent economic growth and high export incomes. The fact that the benefits of JI would accrue in the private sector, outside the control of the government, also explains the government's ambiguity towards investment in JI (Korppoo & Moe 2007).

### 8.7 Negotiating positions and strategies

In order to understand the negotiating position of Russia in the post-2012 negotiations we first must look at its role in the ratification of the Kyoto Protocol. When Russia initially signed the Protocol in 1997 it expected to receive large benefits from quota sales to the United States. Together with other countries (Japan, Canada, Australia, Ukraine, New Zealand, Iceland and Norway) it teamed up with the United States in the Umbrella group, pushing for mechanisms for flexible implementation of commitments. When the US decided to withdraw from Kyoto in 2002, the relationship with the EU became more important. Knowing that the entry into force of the Protocol depended on their ratification, Russia delayed its decision to ratify for more than two years. It demanded side payments, in particular from the EU (Bang *et al.*, 2005). Fearing that binding emission targets would harm domestic economic growth, Russia attempted to ensure that it received economic benefits from Kyoto's flexible mechanisms. Russian officials "claimed that additional assurances of quota purchases or investments were necessary to secure Russian ratification" (Bang *et al.*, 2005: 16). The ratification issue was politically up-scaled when it was linked to the possible membership within the World Trade Organiza-

tion. Although the EU initially and officially rejected the link to WTO membership, both issues were discussed at the 2004 EU-Russia summit. During the discussions the EU endorsed possible WTO membership after Putin promised to speed up the process towards ratification (Bang *et al.*, 2005; Buchner & Dall'Olio, 2005). Since ratification, Russian climate politics have been characterized by internal institutional battles on controlling positions in the future implementation of Kyoto mechanisms (Bang *et al.*, 2005).

Although Russia is an important player in the post-2012 negotiations, it is still unclear whether it will participate in the future process. Russia remains reluctant in taking on further binding commitments. A Russian MEDT senior officer remarked: "This will be a matter to be discussed at international negotiations. It depends whether we shall manage to protect our interests or not. Then we shall think if it is worthwhile to join the next period" (Perelet *et al.*, 2007: 23). The domestic debate on the Russian position in the post-2012 negotiations has not yet started. The Russian Federal Service for Hydrometeorology and Environmental Monitoring (Roshydromet) has initiated talks on future voluntary targets for non-Annex I Parties (Korppoo & Moe, 2007: 7). However, this proposal received criticism from non-Annex I Parties claiming that it distracts attention from the important task of negotiating further commitments by Annex I Parties (UNFCCC, 2007f). The fear that the role of the country could turn from a seller of emission credits to a buyer soon after 2012, because of the economic growth, could be a major issue in the future negotiations. However, following the government emission scenario this could only happen in a third commitment period beyond 2020. It seems unlikely that Russia will be allowed to have such a strong negotiation position as with the Kyoto Protocol. Russia might thus expect fewer co-benefits from the future climate regime. Continued Russian participation will probably rely on Russian public opinion and thus on awareness of climate change effects on Russian territory, which as we have stated is low (Korppoo & Moe, 2007).

## 8.8 Summary

### 8.8.1 Perception of affectedness

Russia's ratification of the Kyoto Protocol was not driven by a perception of urgency or affectedness. There is little awareness of the vulnerabilities or the effects climate change will have on the country. Climate changes have already affected permafrost zones and water resources, such as the Volga River and the Caspian Sea. However, the issue of climate change vulnerability is not yet perceived as being of importance. This attitude is further enforced by the scepticism of many leading figures working on climate change in the Russian scientific community and government institutions. However, new survey data suggests that the Russian public is rapidly becoming more concerned about climate change impacts. A GlobeScan survey found that 59% of Russians considered climate change a 'very serious' problem, up from 43% in 2003 (Henry & McIntosh Sundstrom, 2007). Future Russian participation in the post-Kyoto regime will probably rely on whether this trend towards greater awareness of climate change effects among the Russian public can be sustained.

### 8.8.2 Perception of justice and equity

Perceptions of justice and equity do not seem to play an important role in the negotiation strategies and positions of the Russian Federation.

### 8.8.3 Perception of opportunity

Perceptions of opportunity obviously played an important role in Russia's ratification of the Kyoto Protocol. Being aware of its crucial role in the entry into force of the Protocol, Russia was assured of promising economic benefits provided by the Kyoto mechanisms. More importantly, Russia's strategy in the Kyoto negotiations can be considered an issue linkage. Russia secured EU support for its bid to enter into the World Trade Organization by linking it to the Kyoto ratification issue. As a result of this process Russia and the EU have been brought closer together; sharing more common interests with each other than in previous negotiations. However, it is still unclear whether Russia will participate in the post-Kyoto process. Future Russian participation in the post-Kyoto regime will probably depend on whether the EU is able to convince Russia of the real benefits of hosting Joint Implementation (JI) projects and an emission trading system.





## 9. Mexico in the Post-2012 Negotiations

### 9.1 Introduction

This chapter focuses on Mexico, one of the two OECD countries that did not take on targets under the Kyoto Protocol. Mexico has been called one of the leaders of the developing countries in taking on climate change, even though it is one of the most important oil producers in the world.

This chapter provides an overview of the social and political factors relevant to Mexico's position in the post-2012 negotiations, and provides an indication of Mexico's behaviour so far in these negotiations. We first begin with a short country profile of Mexico, focusing on key socio-economic and climate change and energy indicators as well as its affectedness to climate change. We then give an overview of the country's international commitments and the domestic climate change and energy policies. Against this background we examine what the current negotiation position of Mexico has been since COP-11. On the basis of the foregoing analysis, the country's perceptions on equity, opportunity and affectedness are summarized.

### 9.2 Country profile of Mexico

#### 9.2.1 Socio-economic profile

Mexico has a population of approximately 107 million in a territory of approximately 2 million square kilometres. The annual population growth rate is 1.18%. Of the total population, a quarter lives in rural areas. The number of households is close to 24 million (INEGI, 2007 in: De Buen, 2007). About half of the population lives in poverty. Table 9.1 provides some key indicators of the socio-economic position of Mexico.

*Table 9.1 Overview of selected energy indicators for Mexico.*

Population 2006	107 million
Population growth 2000 – 2005	1.26%
Unemployment rate - 2004	3.8
Illiteracy rate - 2005	7.4
Population in conditions of poverty 2004	47%
GDP PPP—2005 (US\$)	\$1.068 trillion
GDP official rate 2005 (US\$)	\$669.5 billion
GDP per capita 2005 (US\$)	\$10,100
GDP growth rate - 2006	4.8

*Sources: (WRI 2003, in: Pulver; 2006; De Buen, 2007).*

#### 9.2.2 Energy and environment profile

Mexico is one of the most important oil producers in the world, with an average daily production of 3.8 million barrels. 47% of this is for domestic consumption. Natural gas consumption averaged 4.8 billion cubic feet per day in 2005, mostly as gas associated

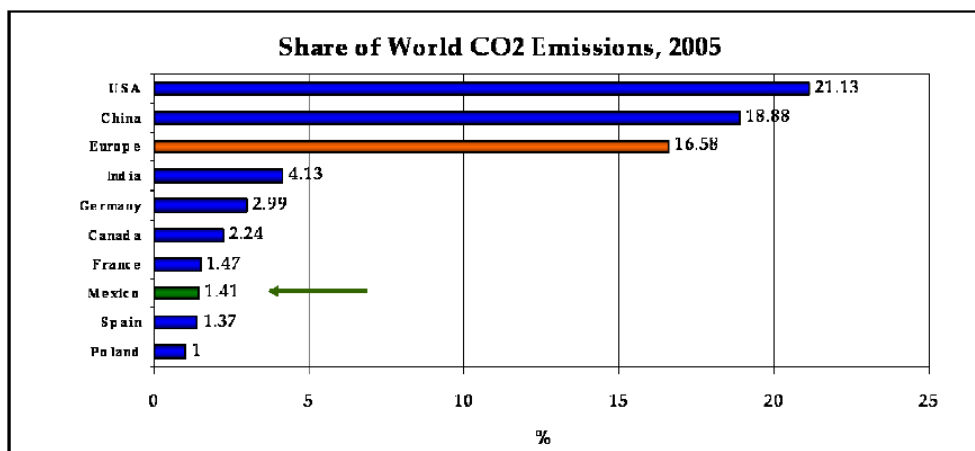
with oil production (BP, 2006, in: De Buen, 2007). Mexico was fourteenth worldwide in proven crude oil reserves in 2006, and sixth among oil producing countries in 2005. Petróleos Mexicanos (PEMEX) was the third largest oil company worldwide in 2004 (INE-SEMARNAT, 2006). Table 9.2 presents an overview of some energy indicators.

*Table 9.2 Overview of selected energy indicators for Mexico.*

CO <sub>2</sub> Emissions in 1999 (million metric tons)	358
CO <sub>2</sub> emission/capita 1999 (metric tons per person)	3.7
Total energy consumption 1999 (metric tons of oil equivalent)	149 million
Energy Intensity/GDP PPP 1999 (metric tons of oil equivalent/US\$)	169

*Sources: (WRI 2003, in: Pulver; 2006; De Buen, 2007).*

Mexico ranks twelfth in the world based on total greenhouse gas emissions and is the second largest emitter in Latin America after Brazil. As shown in Figure 9.1, Mexico accounts for 1.4% of global CO<sub>2</sub> emissions from fossil fuels, excluding other GHGs and land-use change and forestry (World Bank, 2008).



*Figure 9.1 Mexico's Share of CO<sub>2</sub> Emissions in 2005 (as percentage of world emissions, excluding land-use change and forestry) (Source: Energy Information Administration US Department of Energy. In: World Bank, 2008).*

Energy production contributed to 24% of the country's total emissions in 2002; transport 18%; fossil fuel consumption for manufacturing and construction 8%; residential, commercial and agricultural sectors, 5%; and fugitive methane emissions, 6%. Together, fixed and area sources (including energy generation, manufacturing and the construction industry and other energy sectors, not including transport) represented 37% of the total. GHG emissions in the energy category, expressed in CO<sub>2</sub>-eq., showed an increase from 312,027 Gg to 389,497 Gg from 1990 to 2002, which represents a 25% increase (INE-SEMARNAT, 2006).

Mexico's GHG emissions have been growing steadily over the past 25 years as depicted in Figure 9.2.

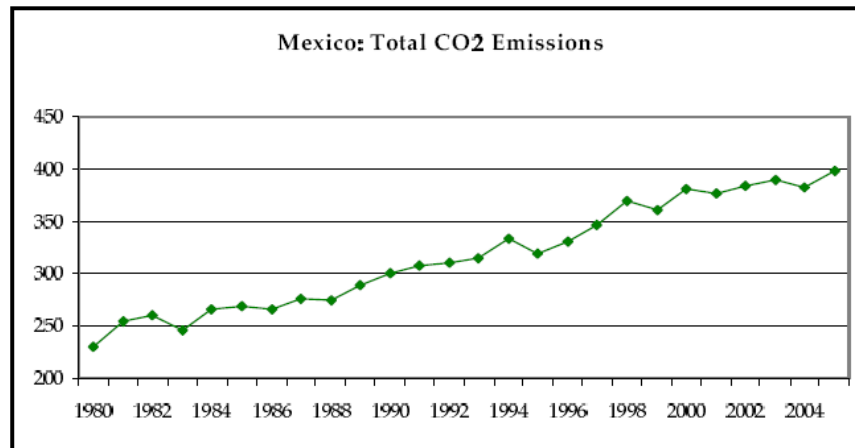


Figure 9.2 Mexico's CO<sub>2</sub> Emissions from Fossil Fuels (excluding other GHG and land-use change) (Source: Energy Information Administration, US Department of Energy. In: World Bank, 2008).

In 2004, the national energy consumption was 6,816 Petajoules (PJ), which is 5.3% more than in 2003. The production of primary energy in 2004 was 10,331 PJ; this represents an increase of 2.6% compared to 2003. 35.1% of the national energy consumption is used for the energy sector itself and 64.5% for total final consumption. Particularly noticeable was the 13.5% growth in the consumption of the transport sector, mainly due to the consumption of gasoline and diesel. The results of the NGHGI 1990-2002, indicate that the growth in emissions for the sectors, except for LULUCF, in CO<sub>2</sub> eq, was approximately 30%, which represents an average annual growth of 2.2% (INE-SEMARNAT, 2006).

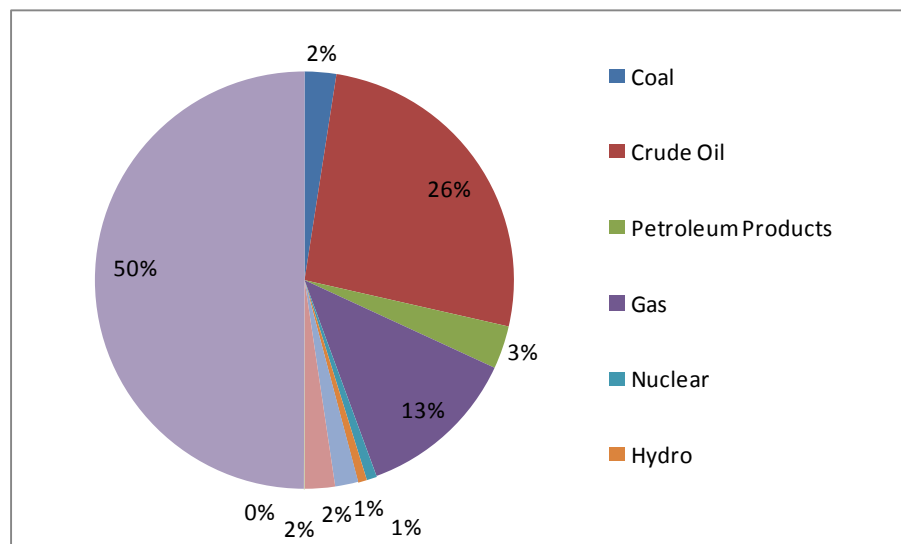


Figure 9.3 Mexico Total Primary Energy Supply (TPES) by source in 2005 (Source: based on IEA, 2007).

In terms of energy conservation, renewable energy and cogeneration issues, the country has a somewhat complex situation. On the one hand, Mexico has energy efficiency and conservation programs in place that have been very successful. On the other hand, renewable energy and cogeneration still make a relatively small contribution to the national energy supply. Policies have either not been put in place or have failed to fulfil their objectives. While several reasons could account for this, the most significant is by far the abundance of oil reserves. Moreover, energy supply companies are state-owned monopolies that contribute heavily to the national budget through their sale of oil. The fact then that there are few advances with regard to renewable energy production and supply would appear to be a result of this situation (De Buen, 2007). The energy saving efforts are however, not only directly driven by an interest in reducing CO<sub>2</sub> emissions. They are also the result of the increasingly higher prices of natural gas and electricity over the last few years. In some cases, especially for companies with international operations, the efforts could also be driven by environmental policies defined by their headquarters abroad (De Buen, 2007).

### 9.3 Affectedness: Physical and social vulnerability

Based on global modelling simulations, Mexico will be disproportionately affected by climate change. The three Mexican regions most vulnerable are, in order of importance: Central, Northern and Tabasco Coast (Conde & Gay, 1999).

One of the projections for Mexico's climate is that it will have more rain leading to floods in some regions. Other regions are expected to have less rain; this is expected to cause more frequent and severe droughts (World Bank, 2008). Mexico City is already facing water shortages, which could be aggravated by an increase in temperature through decreased recharge of the city's aquifers and an increase in evapotranspiration (INE-SEMARNAT, 2006). Under all climate change scenarios, extreme weather events such as hurricanes are expected to increase. The country's large and relatively exposed coastline along the Gulf of Mexico is a frequent landfall point for hurricanes. The cost of hurricanes and tropical storms has already steadily increased (World Bank, 2008).

Projected sea-level rise will lead to further impacts on the Gulf Coast and on Mexico City. The Tabasco State coast will be most vulnerable to sea-level changes. Approximately 40 to 50km of inland sea penetration is predicted. Northern and Central regions are most vulnerable in the agricultural sector, according to application of a crop simulation model (Conde & Gay, 1999). National Communications report that sea-level rise is likely to have adverse impacts on buildings and tourism (UNFCCC, 2007e).

The occurrence of Dengue fever is at this moment increasing in Mexico, the number of cases increased by more than 600% between 2001 and 2007. This expansion could be linked to climate change (The Lancet, 2008).

Mexico is also one of the world's most important biodiversity hotspots. Severe species loss is predicted in the future (UNFCCC, 2007e). For example, rainfall patterns are changing, and this is causing pests such as the roundheaded pine beetle, European mistletoe and caterpillars to attack the forests of Sierra Gorda (IPS Latin America, 2007). The Mesoamerican coral reefs are also likely to be affected (UNFCCC, 2007e). Mangrove forests located in low-lying coastal areas are particularly vulnerable to sea-level

rise, increased mean temperatures, and hurricane frequency and intensity (Magrin *et al.* 2007 in: UNFCCC, 2007e) and could disappear. Fish stocks are also affected by warmer sea waters with resulting negative consequences for fishing in the region (UNFCCC, 2007e).

## 9.4 Institutional context

### 9.4.1 Participation in international institutions

Mexico ratified the UNFCCC in 1993 and the Kyoto Protocol in 2000 (Martinez, 2004). It submitted its first National Communication in 1997, the second in 2001 and the third in 2006, as the only developing country until now to do so (World Bank, 2008). In addition to these multilateral treaties, Mexico has a number of bilateral agreements with countries such as Japan, the US and Canada. Research funds from developed countries have helped Mexico to prepare GHG indexes and research into adaptation strategies. Mexico, together with Cuba is part of the Capacity-Building Project for Stage II adaptation to climate change in Central America, where it helps other countries to prepare adaptation plans and strategies (UNFCCC, 2007e). Recently, the World Bank endorsed a Country Partnership Strategy (CPS) for Mexico, which entails a loan to provide flexible, on-demand advisory services and technical assistance (States News Service, 2008). Most new activities on climate change appear to be driven by bilateral initiatives. In 2003, the United States and Mexico pledged to strengthen bilateral cooperation on climate change, creating a Bilateral Working Group on Climate Change. Canada and Mexico signed a joint statement on climate change cooperation during COP/MOP 1 in December 2005 (Pulver, 2006). At the G8 Heiligendamm Summit in 2007, Brazil, China, India, South Africa and Mexico presented a joint position paper concerning climate change.

### 9.4.2 Domestic climate policies

Interest in climate change in Mexico dates back to the early 1990s and now several policies are in place. The most salient are outlined below.

Over the past 15 years, the National Commission for Energy Savings (CONAE) and the Trusteeship for Electric Energy Savings (FIDE) have been implementing programs for a more sustainable use of energy, which have been very successful (De Buen, 2007):

- Thermal insulation of homes;
- The introduction of highly efficient air conditioning equipment;
- The replacement of 500 thousand incandescent fixtures by fluorescent ones in residential lighting;
- Cogeneration;
- The issuing of 20 official norms on energy saving for household appliances and other products. It is estimated that the energy savings accumulated over the last five years deriving from the programs mentioned reached 39 thousand GWh, which translates to a reduction of a little over 24 million tons of CO<sub>2</sub>.

During the year 2000 alone the country had energy savings equivalent to 11 thousand GWh. This is a reduction of almost 7 million tons of CO<sub>2</sub> with respect to the baseline of 1990 (Martinez, 2004).

In the sector of land use, change in land use, and forests, the main strategies are:

- Increasing the rate of accumulation of carbon, by creating or increasing sinks;
- Reducing the rate of carbon liberation already fixed in existing sinks; and
- Reducing the use of fossil fuels and intensifying that of renewable products.

The main achievements over the past few years in conserving forest ecosystems include:

- The reforestation of more than 740 thousand hectares (Pronare Program);
- Forest planting of more than 47 thousand hectares between 1997-2003 (Prodeplan Program);
- Reclamation of over 1.3 million hectares of agricultural lands for forestry production (Martinez, 2004).

While renewable energy has a very high potential in Mexico, this potential has yet to be realized. A law promoting renewable energy has been in discussion for three years, however no decision has been made. This is probably due to opposition of the national oil company Pemex (De Buen, 2007).

Mexico's Climate Change Strategy identifies measures, establishes emissions reduction ranges and proposes studies to define precise mitigation goals. It proposes strategic and political actions that will serve as the basis for the national climate change program, which is part of the national development plan. The strategy consists of two parts – the 'green agenda' and 'grey agenda' – which respectively correspond to vegetation and land use requirements, and power generation. The grey agenda calls for power generation using renewable sources, efficient energy consumption and reduction of contaminants in gasoline (Business News Americas, 2007).

Among indirect actions of emissions reduction -maintaining captured carbon-, the following programs were continued: Forest Development Project in the Conservation and Sustainable Management of Forest Resources (Procymaf II) in its second stage (2004-2007); Programs of Payment for Hydrological Environmental Services (PSAH); and the Program of Conservation and Reforestation of Forest Ecosystems (Procoref). Actions were expanded in the phytosanitary diagnosis and treatment of forests and rainforests. The surface area under protection increased through the National System of Protected Natural Areas, as well as the number and surface area of Units for Wildlife Management and Use (UMA) (INE-SEMARNAT, 2006). The ProArbol initiative, announced in 2007, offers financial incentives to farmers who plant and care for trees. In total the initiative hopes to plant 250 million trees. The program has already received approximately 80,000 applications, three times what officials were projecting (Chicago Tribune (Illinois), 2007)

Building national capacity is also an important aspect of the policies regarding climate change (UNFCCC, 2005b). Regarding education, training and public awareness, Mexico has substantially increased the number of forums, workshops and publications intended for the public in general and the country's decision-makers in particular. At the same time, a great deal of information related to climate change has been made available to the public through the Internet. It includes research results, statistics and electronic versions of publications produced by the government, research institutions, NGOs and the private sector (INE-SEMARNAT, 2006).

Mexico's National Development Plan 2001–2006 includes strategies to reduce vulnerability to climate change, strategies, which resulted in small farm sector intensification; improved employment opportunities in commercial agriculture; growth of rural non-farm sector; migration of the young; and provision of safety nets for those trapped in poverty (Tearfund, 2006). A shift towards prevention in disaster management has led to the creation of scientific advisory committees, improved engineering standards, *inter alia*, retrofitting schools to withstand high winds, and hospital readiness standards (Tearfund, 2006).

Within North America, Mexico is unique for the absence of a civil society-led campaign around climate change. Climate change is not a priority issue for environmental NGOs in Mexico. There is little public pressure for action on climate change. Most Mexican NGOs focus their efforts on environmental concerns that are perceived as more pressing and deserving of attention (Pulver, 2006).

Based on an assessment by the Climate Performance Index, an independent body that assesses a country's overall climate performance based on per capita GHG emission trends in the energy, transport, residential and industrial sectors; absolute energy related GHG emissions; and climate policy; Mexico ranked fourth in the world behind Sweden, Germany and Iceland (World Bank, 2008).

The Ministry of the Environment and Natural Resources (SEMARNAT) is responsible for leading national policy regarding the environment. The Under Ministry of Planning and Environmental Policy of SEMARNAT has the General Directorate for Climate Change Projects and is in charge of promoting and facilitating the development of projects for the Clean Development Mechanism (CDM). The International Affairs Coordinating Unit (UCAI) has the promotion and organization of the participation of the Ministry and of its de-concentrated bodies in international meetings or forums as a duty, in coordination with the Ministry of Foreign Affairs (SRE) (INE-SEMARNAT, 2006).

In 2005, the Inter Ministerial Commission on Climate Change (CICC) was created. It includes among its members seven ministries: agriculture, transport, social development, environment, energy, economy, and foreign affairs (Pulver, 2006). CICC is a permanent body in charge of coordinating the actions of the offices and entities of the Federal Public Administration. Also in 2005, the Ministry of Energy (SENER) created the Climate Change Committee of the Energy Sector. It aims at being the coordination mechanism for the follow-up, analysis and definition of policies and activities related to Climate Change and CDM in the Energy Sector. It also aims at coordinating actions on climate change with SEMARNAT. The National Institute of Ecology (INE) is in charge of the Coordination of the Program on Climate Change (INE-SEMARNAT, 2006).

Institutional fragmentation is a barrier to mainstreaming climate change adaptation in Mexico (Pulver, 2006; Tearfund, 2006). Climate change adaptation is isolated from the development agenda by its institutional location within the environmental ministry, which has little influence over other government departments. A further problem is that of political discontinuity, which hinders a long-term approach to reducing climate risk (Tearfund, 2006). Given inter-ministerial competition at the federal level and the absence of civil society interest in climate change, the private sector remains as the most promising sector in which to promote bottom-up action on climate change in Mexico in the short term (Pulver, 2006).



## 9.5 Justice and Equity: Framing of the problem

The overall stance of the Mexican government has been that climate change is a serious environmental issue. Mexico perceives a greater risk from climate change impacts than from adverse economic effects of greenhouse gas regulation (Pulver, 2006). President Calderón said in a speech that:

“Climate change involves the future of humanity, the future existence of our nation and the destiny of our children and grandchildren. Putting an end to the problem of global warming requires the commitment of society throughout the world, as well as the commitment of governments.” (Presidencia, 2007b)

The President has also said: “climate change is real, measurable and constitutes one of the greatest challenges facing mankind” (Presidencia, 2007d).

The Mexican government is convinced that both developed and developing nations should contribute to global efforts to combat climate change (Presidencia, 2007c). In the words of the president: “we share the idea that all countries, without exception, have something to do. We have a duty towards the protection of the earth and the containment of the problem of climate change” (Presidencia, 2007a). Mexico sees the UN principle of common but differentiated responsibilities as fundamental to a just climate regime. It agrees on the importance of seeking a post -2012 agreement and is willing to participate in the joint adoption of long-term global goals, and to help achieve them, “in keeping with its capacities and level of development” (Presidencia, 2007d).

But, as a developing country, Mexico adopts poverty eradication as an absolute priority, and avoids policies that may jeopardize economic growth. As such, climate change is both a threat and an opportunity to foster sustainable development, given that Mexico is an oil-exporting nation (UNFCCC, 2005b).

Equity concerns are essential to Mexico, and per capita emissions and their evolution should, according to F. Tudela, Under minister for Planning and Environmental Policy of SEMARNAT, play a more central role in the international regime, “on the basis of flexible convergence in accordance with national circumstances” (UNFCCC, 2005b). Mexico sees GHG mitigation in developed countries as the key to addressing climate change given the perceived historical responsibilities. Developed countries must take the lead by making further truly significant commitments at an early date for GHG reductions in the period beyond 2012 (Joint Position Paper, 2007).

Mexico, in a joint position paper with other influential developing countries, has expressed the need to make the structures of global governance more democratic, representative and legitimate by increasing the participation of developing countries in the decision-making bodies of multilateral institutions.

## 9.6 Opportunities in addressing climate change

### 9.6.1 New policies and technologies

For Mexico, assistance from other countries is needed to address the issues of mitigation and adaptation properly. Mexico and other developing countries also state in a joint

position paper that in order for developing countries to contribute to the efforts to address climate change, access to adequate technology is a key enabling condition. They state the need for an agreement on transfer of technologies at affordable costs for accelerated mitigation efforts in developing countries. According to this paper, capacity building efforts are also needed to enhance developing countries' capacities to deploy mitigation and adaptation technologies (Joint Position Paper, 2007). The resources required for adaptation are not less than those for mitigation. The countries jointly propose that resources from the entire carbon market should be mobilized, as is being done on a small scale from the 2% levy on the CDM proceeds. These resources should be separate from the provision of new and additional resources to tackle the challenges of adaptation. They do not see a diversion of ODA resources as the proper answer as development is a prerequisite for achieving effective adaptation (Joint Position Paper, 2007).

Possible actions Mexico could need in order to overcome barriers that restrict the development of Mexico's potential in mitigation and adaptation policies are:

- Assistance in the development of technical and institutional capacities to design, implement and manage projects and programs;
- Evaluation of renewable energy resources in Mexico;
- Greater application of CDM;
- More detailed analyses of costs of distributed power generation vs. central generation;
- Promotion of best practices for Mexico's industrial and commercial sectors;
- Support the development of public policies that facilitate and accelerate technology adoption;
- Support the development of public policies that mandate distributed generation;
- Support the development of public policies that mandate renewable energy use (De Buen, 2007).

The third National Communication indicates that Mexico requires financing to expand national actions in the identification of programs and projects leading to emissions reduction by sources. Funds are also needed to identify options for carbon sequestration sinks; and in order to select and implement adaptation actions. These will include specific technologies to be used, materials and equipment required, and techniques and practices necessary for applying them. The National Climate Change Strategy also requires funding for monitoring and evaluating its further development and for undertaking the implementation of new projects (INE-SEMARNAT, 2006).

### 9.6.2 CDM potential

A cornerstone of Mexico's interest in the Kyoto Protocol was access to Kyoto mechanisms, in particular CDM. When the US failed to ratify the Protocol, expectations of the potential size of CDM collapsed. This caused a delay in ratification of the Protocol by the Mexican government. Only after the EU had ratified and CDM became a viable mechanism again, did Mexico finally ratify (Pulver, 2006).

Currently, about 7% of the registered CDM projects are implemented in Mexico this is far short of the full potential that CDM could offer. Minister F. Tudela indicated in a speech that:

“Mexico, like other Latin American countries, supports the CDM, but considers that while CDM is useful for inducing positive institutional arrangements, it has largely failed to live up to expectations. Its effectiveness is perceived as relatively poor, its transaction costs are high and it has the potential to become a perverse incentive, limiting developing countries’ mobilization of their own full potential, when improved national legislation and policies threaten to undermine the requisite proof of additionality for individual CDM projects” (UNFCCC. 2005b).

### 9.6.3 Forestry sector

Mexico has made substantial efforts in re- and afforestation projects. In total, 250 million trees are to be planted under the Proarbol project, and farmers will be rewarded for maintaining the trees on their property. This enormous project creates opportunities for tourism. The Mexican government sees sustainable tourism as one of the most promising sectors, where the challenge is to continue constructing hotel and tourist infrastructure without damaging the environment (Presidencia, 2007e).

### 9.6.4 International cooperation and foreign policy

Mexico has benefited from international partnerships and funding in their current climate policies. Institutes from governments and private parties abroad have been helping Mexico in their GHG inventories and other research activities (INE-SEMARNAT, 2006).

As stated above, bilateral agreements on climate change are an important element of Mexico’s climate policy. However these agreements also serve as fora for issues that fall outside the direct scope of climate. For example, during the two-way climate talks between Japan and Mexico preceding the Bali COP, ministers Komura and Espinosa also agreed to boost the ‘strategic partnership’ through political dialogues and a Japan-Mexico free trade agreement (Japan Economic Newswire, 2007).

With the increase in sub- national climate change activities in the United States, there are many prospects for partnerships for Mexico. Activities in the transportation and energy sectors that link US NGOs with business and industry actors in Mexico are particularly promising. Such activities could build on pre-existing environmental arrangements such as air pollution control activities in Mexico City or on the US-Mexico border (Pulver, 2006).

## 9.7 Negotiation positions and strategies

As the only two members of the Organisation for Economic Cooperation and Development (OECD) that did not take on targets under the Kyoto Protocol, Mexico and South Korea will be at the forefront of negotiations regarding developing-country targets (Pulver, 2006). Mexico’s environment minister has emphasized that his country and other developing countries expect to be part of a post-2012 regime. “We are not, and we will not be a free rider of any regime”. Furthering that Mexico is “ready to consider sectoral targets in terms of GHG intensity” (Carbon Control News, 2007).

Mexico’s medium to long-term strategy on climate change includes the need for greater differentiation of responsibilities among advanced developing nations. The minister of

environment proposes a differentiated multi-stage approach for developing countries based on their economic and social condition with varying degrees of commitments and timelines accorded (Carbon Control News, 2007).

Other parties' non-compliance should not affect Mexico's own compliance; it could affect the scope of its commitments, although Mexico is against sanctions for non-compliance. The minister of SEMARNAT has indicated that while Mexico foresees some limited success in mitigation achievements, it will require international support to go beyond these: Mexico considers that over-compliance should win compensation (UNFCCC, 2005b).

The minister of environment has also indicated that some economic sectors may be ready for GHG controls (Carbon Control News 2007). Mexico commends combining soft and hard technologies in the development of risk atlases and early warning systems, which have resulted in greater attention and resource allocation to risk prevention (UNFCCC, 2007e).

During 2008 UNFCCC negotiations, Mexico has been actively proposing the following points:

- Supporting the development and implementation of methods and tools at the local level (IISD, 2008a);
- During the UNFCCC negotiations, there should be sessions on mitigation and adaptation respectively, with technology and finance to be considered in each (IISD 2008b);
- The creation of a multilateral fund under the Convention "with foreseeable and scalable contributions by developed countries and a transparent and inclusive governance structure" (IISD, 2008c);
- The need to improve observation systems and analysis, and planning scenarios;
- The need to strengthen national and regional capabilities; adaptation measures must meet sustainable development objectives and goals, including poverty reduction and access to basic services (IISD, 2008a);
- Timely development of information systems for forecasts and applying disaster prevention plans so communities can protect themselves (IISD 2008a);
- Including the potential of renewables and their implications in relation to adaptation (IISD, 2008d).

## 9.8 Summary

### 9.8.1 Perception of affectedness

Mexico perceives it will be hit hard by climate change. Increases in temperature will mean changes in rainfall patterns: floods and droughts, accompanied by pests, and extreme weather events. Climate change is expected to have a negative impact on agriculture and fishery sectors. Biodiversity in this unique hotspot is also likely to be negatively effected by changes in climate. Coral reefs, mangrove forests and rainforests are threatened. Sea-level rise will have a large impact on the low-lying coastal areas. Mexico City will face increased water shortages. To this degree then Mexico has taken the position that protection of climate is in many regards a more salient issue than that of economic

growth as any negative consequences from climate change will have a greater impact on their economy than no action at all.

#### 9.8.2 Perception of justice and equity

Mexico is stepping up as a global leader in tackling climate change, especially among the developing nations. It perceives the problem of climate change as a real danger that must be acted on by all. Common but differentiated responsibilities for the world's nations are important for Mexico: as the developed countries historically contributed most to the problem, they should be the ones doing most to amend it. Also in the developing countries, divisions should be made among the largest and smallest emitters, and reduction targets should be adjusted accordingly. Global governance should be organized more democratically, representatively and legitimately by increased participation of developing countries. Interestingly however, it must be noted that this argument is propounded despite Mexico's role in oil production and export.

#### 9.8.3 Perception of opportunity

Climate change presents not only threats to Mexico: it also brings opportunities. International cooperation, through mechanisms like CDM, technology transfer, bilateral agreements which also cover free trade and sustainable tourism could help Mexico in addressing both climate change and poverty eradication.

## 10. United States in the Post-2012 Negotiations

### 10.1 Introduction

In this section we attempt to offer a profile of the United States. Given that the US is the world's leading economy, historically the largest emitter of greenhouse gases, the most recalcitrant party in the international negotiations on climate change, and is seen by many as the most important political entity for furthering any post-2012 agreement, we have taken a slightly different approach in this section as compared to the profiles above. Rather than beginning with the presentation of the socio-economic indicators, much of which are known, if not in detail, then at minimum in their scope, we will begin with how we believe the US frames the issue of climate change for itself using what indicators are necessary to frame our story. We also take a more discursive tone in this profile as it is our belief that since the US is in many respects a unique actor on the world stage, their thinking on climate change and the post-2012 regime warrants a different type of analysis.

### 10.2 Framing of the problem

“We believe we need to strengthen our energy security. We believe we need to grow our economy. And we believe the only way to achieve these goals is through continued advances in technology. So we've pursued a series of policies aimed at encouraging the rise of innovative as well as more cost-effective clean energy technologies that can help America and developing nations reduce greenhouse gases, reduce our dependence on oil, and keep our economies vibrant and strong for decades to come.”  
(US President George W. Bush, 16 April 2008)

This recent quote from US President Bush illustrates rather succinctly how the current US administration outwardly frames the issue of global climate change. While climate change is viewed as an environmental problem, the underpinnings of the problem are bounded by issues of energy and economic security. The title of the US' main climate policy strategy, “US Actions to Address Energy Security, Clean Development, and Climate Change” further enforces this view. Energy security or continued access to inexpensive and abundant energy fuels has long been a concern of the United States and has driven much of their foreign and domestic policy for the past 100 years (Yergin, 1992). As a result of having had what they viewed as unlimited access to fuels such as coal and oil (oil currently accounts for almost 60% of their total primary energy supply (WRI, 2008), has enabled the United States in their opinion to become the world's economic leader. Compared to other countries the US, with the exception of China, has the largest share of emissions in the manufacturing and construction sector at 677 MtCO<sub>2</sub> in 2004 and the largest share of emissions in the transportation sector with some 1,800 MtCO<sub>2</sub> (ibid.).

Climate change or more specifically measures to mitigate climate change, with the need to divest dependence on fossil fuels, is seen as a direct challenge to the US' economic and political hegemony and the dynamic of squaring of economic concerns against those of ‘global warming’, as it was it was commonly referred to, have been voiced since the

1997. Nevertheless, as is seen from the President's remarks, the US recognizes the need to reduce its greenhouse gas emissions. This need we posit, however, is not primarily out of environmental concerns (though they exist) but is rather a by-product of its need to divest itself from its dependence on 'foreign' oil due to economic and political concerns. The path that the US has chosen to achieve these goals is through innovative technological advancement, the underlying message being that climate change is a technological problem that can be solved in a mechanistic manner. Framing the issue in this manner opens up avenues for continued economic advancement through the stimulus of domestic research and development funding and the potential for increased exports of environmentally friendly technologies, goods and services. Moreover, it shifts the debate away from the common understanding that climate change mitigation need be addressed through a negotiated cap-and-trade agreement.

### 10.3 Institutional context

Institutionally, despite its past pariah-like status in the international negotiations, the US and the Bush Administration have taken great efforts to showcase their actions in addressing climate change both domestically and internationally.

#### 10.3.1 Domestic climate policies

Domestically, greenhouse gases and their emissions are not regulated under US environmental legislation (i.e. Clean Air Act, National Environmental Policy Act, Endangered Species Act, and Clean Water Act). While legal efforts have been made to classify GHGs as pollutants, thus bringing them under the jurisdictions of environmental law and subsequently requiring that they be regulated by the federal government (specifically the Environmental Protection Agency) in all sectors of the economy, these efforts have not been entirely successful. Legally the majority of climate policy is contained in energy legislation and is implemented by various US departments and agencies across the government. In addition to President Bush's new goal to, "stop the growth of U.S. greenhouse gas emissions by 2025",<sup>5</sup> flagship national domestic policies include, *inter alia*: standards on fuel economy for certain vehicles of 35 miles per gallon (14.8 litres per kilometre) by 2020; production of 36 billion gallons (136 billion litres) of "renewable fuels" by 2022; 70% improvement in lighting efficiency by 2020; improved energy efficiency standards in appliances; improved building codes for energy efficiency increased production of renewable energy; and development of "clean coal" technologies. As the government has stated on many of occasions, these goals are to be reached through increased technological development in both the public and private sector. To that end the government has, *inter alia*, made available US\$ 42.5 billion in loan guarantees for the deployment of clean energy technologies and invested some US\$ 4 billion in energy technology research over the past seven years.

At the state level, a cap-and-trade scheme has been introduced in nine North-eastern states (the Regional Greenhouse Gas Initiative) (Rodi *et al.* 2006), which could possibly be linked to the EU trading scheme in the future (Mehling 2007). Furthermore,

---

<sup>5</sup> See <http://www.whitehouse.gov> ("President Bush Discusses Climate Change", April 16, 2008).

California has put in place legislation mandating regulations and market-based mechanisms to achieve a 25% reduction in greenhouse gas emissions by 2020.<sup>6</sup> In addition, municipalities have started to take action. For example, in April 2007, New York's mayor Michael Bloomberg announced he would work to reduce the city's emissions by 30% by 2030 (CSM 2007).

Various non-state actors, including business and non-governmental organizations, have also actively taken up the issue of climate change, in order to, amongst others, benefit from 'first mover' behaviour. Perhaps the most prominent example of this is the Chicago Climate Exchange, a voluntary emissions trading scheme, with self-imposed binding caps for its business members.

### 10.3.2 International commitments

Internationally, while the US has been a signatory to the framework convention since 1992 they have not ratified the Kyoto Protocol. As is evidenced by their actions in Bali however, it would appear that the US is becoming more open to engaging the international community as a whole in the post-2012 negotiations. Historically, the Bush administration has not used the UNFCCC forum as the primary arena to promote its international climate policy agenda but has tended to engage in regional and bilateral partnerships in parallel. To date they partnered with some 15 countries. The most notable of these being the Major Economies Process on Energy Security and Climate Change whereby they have initiated a series of meetings with 17 of the world's largest economies to discuss ostensibly the global architecture of a post-2012 climate agreement; The Asia-Pacific Partnership on Clean Development and Climate to promote the creation and implementation of new clean energy technologies on a voluntary basis in six Asian-Pacific states (Australia, Canada, China, India, Japan, South Korea); the Clean Technology Fund where they have committed US\$ 2 billion to fund the development and transfer of clean energy technologies to developing countries; and a proposal (in partnership with the EU) to remove tariff and non-tariff barriers on the trade in environmentally and climate friendly goods and services.

It is interesting to note that international climate policy is undertaken by the US Department of State (Ministry of Foreign Affairs) and that they take the lead in international negotiations in consultation with, among others, the Environmental Protection Agency, the Department of Commerce and the Department of Energy.

### 10.4 Physical and social vulnerability

Given the geographical size and topographical diversity of the United States the vulnerabilities to climate change vary greatly from region to region. While the National Research Council and U.S. Global Change Research Program have taken regional variability into account in their climate assessments they have also identified key areas of concern for the United States in general based upon a range of 2.5 to 4 Celsius degrees of warming over the next century. These they have detailed in their document "U.S.

---

<sup>6</sup> [http://www.climatechange.ca.gov/documents/2006-09-27\\_AB32\\_GOV\\_NEWS\\_RELEASE.PDF](http://www.climatechange.ca.gov/documents/2006-09-27_AB32_GOV_NEWS_RELEASE.PDF).



Climate Action Report” which was also submitted to the UNFCCC as their National Communication.

The most significant vulnerable domains addressed are agriculture and agricultural industry, forests and the timber industry, water resources, effects on coastal zones and marine fisheries, extreme temperature variations and human health. It is interesting to note that in comparison to other countries’ National Communications the US offers very little in the way of forward-looking numerical calculations and predictions on the expected impacts. Instead it simultaneously describes past and current trends in environmental changes, e.g. “Louisiana alone has been losing land at rates of about 68-104 square kilometres per year for the last 40 years...” (USDS, 2002) and outlines potential future impacts in general descriptive terms, e.g. “Projected changes in the amount, timing, and distribution of rainfall and snowfall are likely to lead to changes in the amount and timing of high and low water flows...” (ibid). This approach is partly a reflection of the uncertainty in climate science, especially as applied to such a large geographic country but it also may be indicative of how the US views its vulnerability to climate change (see Perception of Affectedness below), and how they frame the problem of climate change. The US as stated takes a strong view that climate change is an issue of economic security. Therefore when examining the vulnerabilities to potential changes in the natural environment they highlight in the National Communications the vulnerabilities of economic sectors that are most dependent on the natural environment, namely agriculture, forestry and marine fisheries.

Agriculture and the production of food and fibre commodities are, as the National Communication describes, one of the cornerstones in US society and as a whole make up some 10% of the overall US economy. Moreover, agricultural productivity has continued to grow at a rate of approximately 1% a year since 1950s (USDS, 2002). Under the government’s climate change scenarios, barring any decline in agricultural technology or policy, productivity of the majority of their staple crops, is expected to increase in the next 100 years. Despite this expected growth the major threat to agriculture is the yearly regional variability and intensity of climatic events which could lead to water stress, soil erosion and destruction of crops. While these threats are unpredictable, the government takes the approach that they can be managed with the improvement of agricultural technologies.

US forests make up over 30% of the territory and provide environmental services, recreational and economic opportunities (the US is the world’s largest producer of wood products) as well as serve as carbon sinks (USDS, 2002). Under US climate scenarios, forest cover and especially commercial plots are expected to increase. Nevertheless, they are considered to be mainly under threat by drought, natural disasters, and invasive pest species. Perhaps one of the greatest threats of forests on socio-economic livelihoods is forest fires, which would appear to be on the increase in certain regions of the country (NIFC, 2008).

Commercial and recreational fishing contributes approximately US\$ 40 billion to the US economy each year (USDS, 2002). According to the National Communication, climate change has the potential to effect the population, spawning grounds, feeding grounds and migration of commercially important fish species both positively and negatively. For example, the number of Pacific salmon is expected to decrease while populations of Pacific

sardines are expected to increase. While no further impact assessment is made for fisheries the fact that it is addressed points to the fact that it is a considerable concern.

### 10.5 Negotiation position

Given the well-publicized US position, we will limit our discussion here to a minimum. The US negotiating position under the Bush administration has been quite consistent over the years. From 2001 until 2007 they have vigorously opposed taking on binding emissions reductions targets firstly (though this opinion is changing) based on the position that the science to attribute a change in climate to human activities was weak (AMJIL, 2008) and secondly that adopting such targets would have a significant negative effect on the US economy (White House, 2008); historically pursuing the logic that countries should be allowed to implement their own targets based on national strategy (AMJIL, 2008). Moreover, discussions on a post-2012 regime largely too met with resistance from the US side.

In the negotiations in Bali the US began to slightly alter its position appearing to take a more constructive and less hostile approach. On the one hand the opinion towards the climate science and causality of climate change has softened due in large part to the IPCC's Fourth Assessment Report,<sup>7</sup> and on the other the US appears to be more committed to helping construct a post-2012 climate regime (still however adhering to their separatist bilateral and regional approach). They are still reticent about taking on binding emission reduction targets nonetheless and continued to insist that they will not accept a cap on emissions unless rapidly developing economies, in particular China and India, are also willing to do such. As has been stated, the US believes that the most viable manner in which to mitigate climate change is through technological innovation, this innovation however must not pose a threat to US commerce and trade. To that end the US was opposed to the position of China and the G77 in the discussion on technology transfer that Annex I countries make available climate mitigation technologies at below market value, preferring instead the creation and contribution to a climate technology fund to be managed by the World Bank.

### 10.6 Discussion of perceptions

#### 10.6.1 Perception of affectedness

From an environmental perspective the perception of affectedness to climate change appears to be low. This is partly based perhaps on some of the political faction's scepticism to the degree of which the climate is changing but more pronouncedly it is grounded on the US perception of optimism and current as well as continued technological advances to address physical and climatic problems. These perceptions are not only encapsulated in the higher echelons of the government, as is evidenced by President Bush's remarks on climate change in his 2007 State of the Union address, "America is on the verge of technological breakthroughs that will... help us to confront the serious challenge of global climate change." (White House, 2007), but also in how it presents its climate vulnerabilities in the national communications as well as climate change strategy. Look-

---

<sup>7</sup> See remarks of negotiators Watson and Dobriansky at COP 13 [www.state.gov](http://www.state.gov).

ing specifically at the 2002 National Communication, while many uncertainties are presented on the potential impacts much of the expected vulnerabilities and impacts are presented in such a manner that the problem can or will be mitigated through a technological solution. One striking example of the overall tone which poignantly captures this view is on page 82 (in the section on Impacts and Adaptation) where it is stated that, “With either weak or strong warming... the US economy should continue to grow, with impacts being reduced...” (USDS, 2002). This statement we suggest underlines and reveals the fact that the US does not view climate change as a climate problem per se but as an economic one. Thus their main perception of affectedness is economic affectedness.

The issue of economic affectedness for the US is two-fold, the first is how a change in climate will directly effect the US economy and industry and the second is how the climate negotiations, and in particular a post-2012 agreement will effect its economy. Examples of the first perception can again be derived from the US National Communication (apart from the quote above), whereby many statements in the impacts section make reference to impacts on US industry, most notably agriculture and forestry. Examples of the second can be derived from their negotiating position (as seen above) and the US’s desire to link the negotiations to policies on international trade, in particular two issues: offsetting border measures (carbon tariffs) and non-tariff barriers to trade in climate friendly technologies (see Brewer, 2008). In relation to carbon tariffs, the US feels that if the cost of energy is cheaper in countries that it directly competes with (China, India and Brazil) as a result of not taking on binding emission reduction targets that the price of foreign carbon intensive goods will be cheaper, putting the US at a competitive economic disadvantage. Hence they advocate a tariff should be placed on such goods. In relation to non-tariff barriers, the dynamics are as such. As noted, the US sees climate change as a dilemma that can be addressed in a technological manner and view themselves in a strong a position to develop and export such technologies (see section on perceptions of opportunity). Non-tariff trade in these goods would be beneficial to US industries while conversely, if as has been advocated by China and the G77, that access to these technologies is, “related to [the] public good” (WSJ, 2006) and that access to US technologies be made available below their market value, the US will be at a competitive disadvantage.

This framing of climate change as an economic and technological concern also shapes the US’s perceptions of opportunity.

#### 10.6.2 Perception of opportunity

Since its founding, the United States has seen itself as the land of opportunity and since the 20<sup>th</sup> century a country that tries to capitalize economically and politically on dilemmas in the global arena. While the current administration might not outwardly be expressing the same social attention towards climate change as other nations it does view it as a means of furthering its own economic interests. Brewer (2008) in his review of US climate and trade policies highlights a number of initiatives that we feel underscore the US’s opportunistic economic position towards climate change. The most notable being the promotion of US technologies abroad that contribute to greenhouse gas mitigation, renewable energy and energy efficiency. Under the 2005 Energy Policy Act (PL 109-

58), there is a provision that mandates the US Trade Representative to, “(1) identify developing countries’ barriers to U.S. exports of greenhouse gas reducing technologies, (2) negotiate their removal, and (3) report to Congress annually on progress in achieving their removal” (as taken from Brewer, 2008). Furthermore, the 2007 Energy Independence Act (PL 110-104) calls for (1) the US Agency for International Development to explicitly support programs in developing countries that utilize US made products and technologies that address environmental issues, (2) calls for the US Commerce Department to promote exports of “clean and efficient energy technologies” especially in China and India and, (3) asks for the US Overseas Private Investment Corporation (an agency that helps US companies invest abroad) to give preferential treatment to US companies that use US technologies in the promotion of “clean and efficient energy technologies”.

While this dynamic of promoting national commercial interests abroad is not by any means uncommon for a country, what is unique in this circumstance is that the US government has explicitly linked the promotion of economic commerce abroad to climate change, given the charge to promote these policies to the range of offices and agencies that deal in commercial overseas relations, and that this explicit linkage was debouched just after the Kyoto Protocol came into force. In an effort to implement this economic and climate agenda the Bush administration has entered into what it calls bilateral and regional partnerships with 15 countries and regional organizations. The partnerships are meant “to develop effective and science-based responses to the challenge of global climate change with friends and allies throughout the world” (USDS, 2008), which ostensibly they do. However given the positions stated in the Energy Acts of 2005 and 2007, one could posit that there are also clear economic opportunities being pursued simultaneously.

### 10.6.3 Perception of justice and equity

Given the relative strength of the US economy, historical levels of greenhouse gas emissions and dominance of US culture, judging their perceptions of justice and equity in the international arena of climate change might at first appear to be a debatable endeavour, even though they accepted in 1992 the principle of common but differentiated responsibilities. The common perception of the United States, especially since 2001, is that they are in the commanding position to address such concerns in other countries but have neglected to do such. Be that as it may, if we are to gain a clearer profile of the US we must recognize that as with other countries in this report that the US too has its own perceptions within the post-2012 debate on climate change. These are directly related to their perceptions on affectedness and opportunity and we posit two-fold in nature. The first is the assurance of an equitable and fair economic arena in which to trade in climate technologies and services and the second is what we call ‘reverse equity’ where the US feels that as a result of its historical economic growth (tied to greenhouse gas emissions) and its now singular position in the world, it has been and will continue to be the bearers of economic prosperity and democracy to some developed nations.

As has been discussed above, the United States, at present, primarily views the debate on climate change as an issue of economics. How they will be affected is cast in terms of economic growth and potential threats to industries; the opportunities to be capitalized upon relate directly to US trade and commerce. Concerns of equity and justice then re-

volve around (as with many developing countries) the ability to maintain their development if not on a “level playing field” then at least not from a position of disadvantage. This was made evident in 2001 when President Bush rejected the Kyoto Protocol stating that the United States at the time was facing economic difficulties (and a potential energy shortage) and that a cap on its own emissions while omitting developing countries would unduly burden the US economy. This position has not changed in the intervening years, from Montreal to Bangkok the US has insisted that if it is to take on binding emission reduction targets then so must its direct (developing country) economic competitors. This position was recently reinforced in President’s Bush’s remarks on climate change this past April.<sup>8</sup> While this dynamic is certainly not new, it simply helps to re-illustrate the strong non-environmental perception the US holds in the climate negotiations and that if any leverage is to be made it must be done from an economic perspective.

The issue of reverse equity is indicative of how the US has viewed itself since the Second World War. It is well detailed that since the 1940s the United States has perceived itself as the world’s political and economic leader and that it has a moral responsibility to transpose its values of democracy and justice for the development of other nations, thus a further detailed discussion of this perception is not necessary here. What is of relevance is that this perception is also applied to the debate on climate change and especially in the domain of technology transfer and trade. As we have seen above technology transfer and trade is the United States’ means of addressing the environmental impacts of climate change while at the same time boosting its economic balance sheet. Concurrently though, when looking at the topic through the lens of justice and equity, it is also the United States’ means of projecting its power to promote equity and justice. To this end and briefly, one need only consider the US\$ 2 billion committed the Clean Technology Fund that, as the US climate policy document states, will “fund capacity building in developing countries” (USDS, 2007). Or President Bush’s recent remarks where he stated, “We must help countries in the developing world gain access to the technologies, as well as financing that will enable them to take a lower carbon path to economic growth”.<sup>9</sup> The United States ability to project its power in such a manner is predicated in part on its past ability to expand industrially and economically due to cheap and abundant fossil fuel supplies, the same type of fuels that are at the root cause of the climate change. The argument can be made though that had the US not been able to develop as they have, they would not have been able to fulfil their moral responsibility in helping the rest of the globe develop; or in short, the United States’ development, based on fossil fuels has been and is the world’s development. Therefore the issues of equity propounded by countries such as India and China, that based upon the polluter pays principle the US should take the first step in adopting binding emission reduction targets to reverse the damage done and enable other countries to prosper are themselves reversed. The United States is and has been helping them and will continue to do so as long as it is in a position to do so. This overall perception is that imposing limits on America’s growth will have negative consequences for other countries.<sup>10</sup> Much of the perceived arrogance of the US’s negoti-

<sup>8</sup> See [www.whitehouse.gov](http://www.whitehouse.gov), “President Bush Discusses Climate Change”, April 16, 2008.

<sup>9</sup> Ibid.

<sup>10</sup> For a more detailed discussion on the argument of what we call “reverse equity”, see Wall Street Journal, April 10, 2008 or Goklany, 2007.

ating position can be attributed to this issue, and if better understood might open up avenues of opportunity for other parties.



## 11. Conclusions

### 11.1 Reiteration of research goals

In this report, we have attempted to accomplish several tasks in a relatively short document. Recognizing that the drive to reach a comprehensive post-2012 climate agreement represents an unstructured policy problem with a divergence of actors negotiating from different perspectives, we have sought to bring more methodological clarity on how to investigate a country's actions within the post-2012 negotiations. Our first step was to create a policy perception framework. How countries act in negotiating an agreement is fundamentally based on a country's socio-political and economic conditions and how they perceive the issue of climate change in light of those conditions. The framework is thus meant to serve as means of categorizing the dominant socio-political perceptions underpinning the climate change debate; namely the perceptions of justice and equity, perceptions of affectedness, and perceptions of opportunity.

We then turned towards the application of the framework by creating country profiles of the most dominant actors within the post-2012 climate debate (Brazil, China, India, Mexico, Russia, South Africa, and the United States) based upon the key perceptions. The profiles are meant to serve two purposes: they are a gateway to understand where the countries currently stand vis-à-vis climate change in light of their perceptions, and secondly, they are to help identify (future) leverage points or issues that could be used to shift the individual negotiation positions of the countries towards accepting the so-called 'grand coalition' post-2012 agreement.

### 11.2 Conclusions

Below we present a main summary of the perceptions as they have emerged from our profiles.

#### Affectedness

Perceptions of affectedness appear to be an issue in all case countries, perhaps with the exception of Russia. However, affectedness is addressed differently. While some countries focus on environmental affectedness (such as Mexico), others define affectedness in economic terms, such as the US. For some countries, the science of understanding climate vulnerabilities is limited, or research is just beginning, putting them in a position of greater uncertainty. Perceptions are thus not necessarily derived from their own experience. In this case we may think especially of India and to some degree China.

For instance, where Mexico perceives it will be hit hard by climate change – taking the position that protection of the climate is in many regards more salient than economic growth – the US takes the stance that climate change mitigation, despite the perceived environmental consequences, poses a greater threat for their economy in terms of trade and technological development. South Africa, perhaps similar to the US, appears to be aware that climate change could have serious environmental impacts; however, concerns over the loss of its domestic fossil fuel energy supply dominate. Yet the South African



government is also aware that it cannot sit back and wait until other countries take action. For India, domestic research investigating future climate impacts has just begun in earnest. While this has not mitigated their concern for taking action, it does perhaps suggest that with greater knowledge, greater commitments could be expected. Similarly, domestic awareness of climate vulnerability in China is relatively recent. Like India, while climate change mitigation is an important issue on the Chinese political agenda, a deeper understanding of the potential impacts might serve to elicit more action. This, however, is buffeted by the fact that like South Africa, China has significant reserves of fossil fuels at its disposal, which it plans to exploit (barring any developments in clean energy technologies).

### Justice and equity

The perception of justice and equity is the most straightforward perception to emerge from our country profiles (with the exception of Russia that appears not to address the issue). On the one hand, the United States propounds the discussion of 'reverse equity', stating that developing countries are now better off socially and economically as a result of the developed countries' efforts at economic expansion and social development since the industrial revolution (especially that of the US). While developed countries may be seen as the sole cause of the problem, poorer nations are certainly a beneficiary. The argument of historical responsibility and of the need of the US to accept binding emissions reduction targets while large developing countries do not, is thus met with great scepticism in the United States.

Conversely, the remainder of our case study countries stand firmly behind the principle of common but differentiated responsibilities in the treaty, though in varying degrees, proclaiming that the US must increase mitigation efforts and fully engage in negotiations. China, India and Brazil are perhaps the most outspoken on the issue, in part due to their leading roles in the G77. However, the root causes of developing countries' perceptions of justice and equity are not uniform but would appear to stem from a panoply of reasons that are specific to each actor, including their understanding of the Rio Declaration and the climate treaty. Nevertheless, three aggregate issues can be distilled to help elucidate this perception: issues of sovereignty, as with the case of Brazil and the Amazon; issues of economic protection and gain, as is the case with Mexico's oil industry or China's (and to some degree India's) rapidly growing economy; and issues of scientific uncertainty of how vulnerable a country is to climate change (affectedness). These issues then feed the perceptions that each actor is in some degree asked to do more than they perceive as fair or just.

### Opportunity

Unlike the perceptions of affectedness and justice and equity, the perception of opportunity is perhaps the most difficult to generalize across countries. While it can be stated that for the majority of countries, perceptions of opportunity revolve around opportunities of financial or material gain, the perception on how these gains would be achieved varies. Moreover, beyond material gain there is the implicit (and sometimes explicit) expression of political opportunity to be realized within the negotiations. This enhancement of political opportunity naturally feeds into the capitalization on material opportunity. China, for example, portrays itself as a 'leader' of the G77 and attempts to that end

frequently to set the negotiation agenda with what it (and others) see as the most salient issues; technology transfer being one of the most prominent. Brazil also takes on the mantle of ‘leader’ of South America, given its size and economy.

Given the difficulties in making generalizations for this perception we will briefly highlight the key points for each country individually.

*Brazil* realizes the opportunities arising from its frontrunner status in biofuels production and use, and acknowledges the potential technological and financial benefits as a mature and stable host for CDM projects. Yet, to date, it seems to have perceived its rainforest more as a liability than an opportunity in the climate negotiations, ignoring the substantial financial flows—and internal political impetus and support for effectively combating deforestation—that a REDD mechanism could provide.

For *India*, CDM has great potential and to that end India perceives the CDM as the main opportunity within the climate domain that will help contribute to its economic growth. Its active participation in developing such projects is evidence of this.

For *Mexico*, while climate protection is high on the agenda, the opportunities that result from it should address their main social concern, reducing and eradicating poverty. Within the climate realm, CDM along with technology transfer and free trade agreements are perceived as the best vehicle.

In *China*, CDM is seen as having great potential, and the opportunity for technology transfer (at discounted rates) appears to be the main driver of this perception.

For *South Africa*, the main opportunity benefits lie within CDM as well as mainstreaming efforts in developing aid policies of developed countries, establishing multilateral mechanisms for technology transfer, and enhanced capacity building.

For *Russia*, who was a critical actor in bringing the Kyoto Protocol into force, opportunity in the post-2012 regime is not so apparent. While they certainly perceive themselves to be an important player it remains to be seen how much influence they will have. Nevertheless, if Russia is to be included as a supporter of the grand coalition linking opportunities to issues outside the climate debate need to be explored further. Finally, for the *United States* the main opportunities it perceives are in the domain of enhanced trade agreements for the promotion of US technologies abroad.

### 11.3 Further research

With such a compilation of information as is contained in this report, many questions arise, and opportunities for future research present themselves. As stated above, this report is meant to serve as a first step in identifying leverage points that could potentially enhance the amenability of countries to accept the EU’s ‘grand coalition’ proposal. Nevertheless, being based primarily on a review of (English language) literatures, this report has not been able to comprehensively assess all key motivating factors for these countries. The distinctions that emerge are distinctions from a varied set of documents that do not lend themselves to making definitive judgments of any one actor. Moreover, in order to better identify potential leverage points there are several reasons that call for a much deeper examination of the positions of countries in the climate change arena:

- First, what individual negotiators say at international negotiations are their ‘negotiating’ positions and not necessarily what they would settle for. Studying these positions does often not reveal what their ‘reserve’ or fall-back negotiation position is.
- Second, there is often a major divide between the foreign policy system of a country and what is actually happening within the country. Differences are motivated, for example, by the desire to uphold certain (broader) principles in international negotiations while still taking a pragmatic approach to problems domestically.
- Third, countries are not unitary bundles of interests but represent considerable negotiation processes between the different interests and sectors within them. Domestic power politics often leads to shifts in positions of countries, and understanding which ministry is in power domestically at a moment of time, may give better insights regarding the opportunities for creating an agreement. For example, agricultural and water ministries may have had far less clout vis-à-vis energy and economic ministries in defining the climate agenda, but as water and food crises further develop, these ministries may also become more influential in shaping policies.
- Fourth, countries face critical implementation bottlenecks that cannot be dealt with through catch-all universal phrases such as technology transfer, good governance and capacity building. Understanding the context-specific issue linkages is often a missing element in this research.
- Fifth, many of these countries are federal democratic states (India, USA, South Africa, Russia, Mexico), where power is shared differently with respect to different issues between the federal authority and states. Such power sharing often implies that the federal authority has much less jurisdiction over some issues than the outside world may be tempted to think.
- Sixth, even in a highly unitary government such as China, where mandates are not so scattered, there is still space for local level initiatives and action. Capitalizing on these is critical for moving the climate regime further.

The nature of the questions addressed in this study therefore requires a more detailed research effort that goes beyond a mere literature review. In a nutshell, a systematic assessment of primary sources from the countries analyzed, including a series of semi-structured interviews, is required to gain a more complete understanding of the driving forces behind a country’s negotiation position. Such more intense research can be designed in a way that reduces costs, for example through focussed interviews at conferences and workshops; through a more systematic assessment of national publications which can often be done through internet research; and through a more extensive review of the secondary literature on the countries studied (e.g., on the foreign policy system, the environmental policy system, the particular type of federal or centralized government system, etc.). Despite these options for an efficient research approach, a reduction in the number of countries studied might be advisable.

Questions that could be addressed in a more intense research effort include, for example:

1. What are the formal ‘aspirational’ and informal ‘reserve’ negotiating positions of countries in the international climate change regime? What are these positions in other fields of global governance? Can an understanding of the ‘reserve’ positions

and possible issue linkages to ‘aspirational positions’ in other fields of governance provide insights into how a future climate change regime can be constructed?

2. What does an assessment of existing and planned relevant policies and their implementation reveal in terms of opportunities for further reduction of greenhouse gases? What instruments can be designed to deal with these challenges?
3. What are the differences of opinions and interests between different ministries, sectors and actors with respect to their country’s national and foreign policy on climate change? How can transnational sectoral and international agreements and instruments be designed to account for, and build on, these differences?
4. What are the key implementation bottlenecks in specific sectors and arenas within countries? How can these implementation bottlenecks be addressed in a way that mitigation of greenhouse gases can be accelerated?
5. Given the global trend towards decentralization and pluralism, how effective is the ‘state’ as entity in negotiating issues of global governance? Should issues be re-centralized in order to empower states to more effectively negotiate, or should international inter-state governance be complemented by new forms of transnational governance, such as public-private partnerships (with global reach)?

These are just a sample of questions that could be addressed if we are to gain a more serious understanding of how to move towards a more stable climate regime.

In addition, there are a number of broader questions that are important but could not be sufficiently addressed within the limited scope of this study.

1. First, this study has excluded the entire issue area of adaptation, regarding both local and national adaptation policies, and global adaptation governance. These questions, however, emerge as key issues on the national agenda of many countries, and increasingly also on the international agenda, for example regarding climate refugees (Biermann and Boas 2007). A ‘grand coalition’ for climate governance will therefore have to seriously consider also the adaptation needs of countries. Only an explicit link between global mitigation and adaptation policies will bring the critical mass of countries needed for a successful climate governance architecture.
2. Second, this study has looked at economic opportunities of countries largely in the climate negotiations. However, it is apparent that the ‘reach’ of the problem of managing the carbon cycle goes far beyond current climate negotiations. An increasing literature addresses the relationship between climate and trade policies (Biermann and Brohm, 2005; Asselt and Biermann 2007), or between climate and food policies. Yet many other policies that are of pivotal relevance for mitigation of climate change as well as adaptation, are still outside the core of climate negotiations, and are likely to remain so. Thus, more research is needed to study the complex of ‘climate and...’ policies: unregulated or differently regulated areas of global and national governance that have important influence and repercussions for the climate problem.
3. Third, this study hardly looked at methodological issues; in particular, it has not addressed issues on how political science research – for example on the foreign policies of countries – can contribute to climate policy research programmes that draw

on modelling and scenario work. Partially, this is addressed in other research projects jointly conducted by PBL and IVM-EPA. Partially, however, this methodological problematique will require increased efforts in bridging divides between computer-based modelling groups and social science research. Avenues for such research could be, for example, linking different sectoral models with evidence-based research on the strength of different ministries and policy networks in (a majority of) countries. The development of a global architecture for adaptation, as a second example, will not be feasible without intense collaboration between natural sciences, scenario-builders, and place-based social science research.

In sum, this study has shed some light on important questions, but with each new finding, new research questions emerged. The study showed the immense complexity once the ‘black box’ of the foreign policy of (major) countries is opened up, and it gave further evidence that simplistic models based on rational unitary nation-state actors are not likely to provide reliable understanding of ongoing negotiations. However, given the limited resources and time available for this project, a large part of the research frontier had to remain unexplored.

## References

- Agarwal, A., Narain, S. & Sharma, A. (1999). *Green Politics: Global Environmental Negotiations*. Centre for Science and Environment, New Delhi.
- Allianz (2007). *Brazil Climate Change Profile. Part 5: Opportunities*. Available at [http://knowledge.allianz.com/en/globalissues/climate\\_profiles/climate\\_brazil/climate\\_profile\\_brazil\\_opportunities.html](http://knowledge.allianz.com/en/globalissues/climate_profiles/climate_brazil/climate_profile_brazil_opportunities.html).
- AMJIL (2008). U.S. Positions in International Climate Change Negotiations. *American Journal of International Law*, 102-164.
- ANC (2007). *ANC 52<sup>nd</sup> National Conference – Resolutions*. Available at: <http://www.anc.org.za/show.php?doc=ancdocs/history/conf/conference52/resolutions.html#climate>.
- Asselt, H. van, Biermann, F. (2007). European Emissions Trading and the International Competitiveness of Energy-intensive Industries: A Legal and Political Evaluation of Possible Supporting Measures. *Energy Policy* 35, 407–506.
- Avdeeva, T.G. (2007). Russia and the Kyoto Protocol: Challenges Ahead. *Review of European Community & International Environmental Law (RECIEL)*, 14(3), 293-302.
- Babu, N. & Michaelowa, A. (2003). Removing Barriers for Renewable Energy CDM Projects in India and Building Capacity at the State Level. *HWWA Discussion Paper 247*. Hamburg Institute of International Economics, Hamburg, Germany.
- Bang, G., Heggelund, G. & Vevatne, J. (2005). *Shifting Strategies in the Global Climate Negotiations*. FNI report 6/2005. CICERO report 2005:08. The Fridtjof Nansen Institute: Lysaker, Norway.
- Baumert, K. & Winkler, H. (2005). SD-PAMs and International Climate Agreements. In Bradley, R., Baumert, K. & Pershing, J. (Eds.), *Growing in the Greenhouse: Protecting the Climate by Putting Development First*. (pp. 15-23). Washington, D.C.: World Resources Institute.
- BBC News (2008). *Brazil Amazon deforestation soars*. BBC News, 24 January 2008. Available at <http://news.bbc.co.uk/2/hi/americas/7206165.stm> (accessed 13 May 2008).
- BBC World Service (2007). *All Countries Need to Take Major Steps on Climate Change: Global Poll*. Available at [http://www.worldpublicopinion.org/pipa/pdf/sep07/BBCClimate\\_Sep07\\_rpt.pdf](http://www.worldpublicopinion.org/pipa/pdf/sep07/BBCClimate_Sep07_rpt.pdf).
- BFAI (2006). *CDM Market Brief – South Africa*. Available at: [http://www.bfai.de/nsc\\_true/DE/Content/SharedDocs/Anlagen/PDF/CDM/cdm-markt-suedafrika-english,property=publicationFile.pdf](http://www.bfai.de/nsc_true/DE/Content/SharedDocs/Anlagen/PDF/CDM/cdm-markt-suedafrika-english,property=publicationFile.pdf).
- Biermann, F. (2005). Between the USA and the South: Strategic Choices for European Climate Policy. *Climate Policy* 5: 3, 273–290.
- Biermann, F. & Brohm, R. (2005). Implementing the Kyoto Protocol Without the United States: The Strategic Role of Energy Tax Adjustments at the Border. *Climate Policy* 4: 3, 289–302.
- Biermann, F. & Boas, I. (2007). *Preparing for a Warmer World. Towards a Global Governance System to Protect Climate Refugees*. Global Governance Working Paper 33. Amsterdam et al.: The Global Governance Project.
- Born, R., Green, A., Polycarp, C. & Lutes, M. (2005). *China, India, and Brazil: activists debate climate change (part one)*. Available at [http://www.opendemocracy.net/globalization/climate\\_change\\_debate/article\\_2520.jsp#one](http://www.opendemocracy.net/globalization/climate_change_debate/article_2520.jsp#one).
- Brazil (2004). *Brazil's Initial National Communication to the United Nations Framework Convention on Climate Change*. Brasilia: Ministry of Science and Technology.

- Brewer, T. (2008). *U.S. Climate Change Policy and International Trade Policy Intersections: Issues Needing Innovation for a Rapidly Expanding Agenda*. Paper for Seminar of the Center for Business and Public Policy, Georgetown University.
- Buchner, B. & Dall'Olio, S. (2005). Russia and the Kyoto Protocol: The Long Road to Ratification. *Transition Studies Review*, 12(2), 349-382.
- Business News Americas (2007). Calderón; Climate change strategy includes renewables. *Business News Americas*, May 28.
- Carbon Control News (2007). Mexico plans to include developing nations in post-Kyoto pact. *Carbon Control News*, October 1.
- CBD (5-6-1992). *Convention on Biological Diversity*, (Rio de Janeiro), in force 29 December 1993, 31 I.L.M. 1992.
- Chandler, W., Schaeffer, R., Dadi, Z., Shukla, P.R., Tudela, F., Davidson, O. & Alpan-Atamer, S. (2002). *Climate Change Mitigation in Developing Countries. Brazil, India, China, Mexico, South Africa, and Turkey*. Arlington, VA: Pew Center on Global Climate Change. Available at [http://www.pewclimate.org/docUploads/dev\\_mitigation.pdf](http://www.pewclimate.org/docUploads/dev_mitigation.pdf).
- Chicago Tribune (Illinois) (2007). Mexico taking a lead role in global warming fight. *Chicago Tribune (Illinois)*, June 10.
- Chinadaily (2007). Developing nations' green efforts 'ignored'. *Chinadaily.com.cn*, September 28.
- Conde, C. & Gay, C. (1999). *Impacts of Climate Change and Climate Variability in Mexico. Acclimations. Newsletter of the US National Assessment of the Potential Consequences of Climate Variability and Change*, September-October.
- Council of the European Union (15-5-2007). *The South Africa-European Union Strategic Partnership Joint Action Plan*. Brussels. Available at: [http://www.eusa.org.za/en/PDFdownload/Agreements/EU-SA\\_Strategic\\_Partnership\\_Joint\\_Action\\_Plan\\_May\\_2007.pdf](http://www.eusa.org.za/en/PDFdownload/Agreements/EU-SA_Strategic_Partnership_Joint_Action_Plan_May_2007.pdf).
- CSM (2007). 'New York City's Mayor Wants the City to Turn Green'. *Christian Science Monitor*, 23 April. Available at <http://www.csmonitor.com/2007/0423/p03s02-usgn.html>.
- Dasgupta, C. (1994). The Climate Change Negotiations. In Mintzer, I.M. & Leonard, J.A. (eds.) *Negotiating Climate Change: The Inside Story of the Rio Convention*. (pp. 129-148). Cambridge University Press, Cambridge.
- De Buen, O. (2007). *Decarbonizing Growth in Mexico*. Human Development Report 2007/2008. Fighting climate change: Human solidarity in a divided world. Human Development Report Office Occasional paper. 2007/21.
- DEAT (2004). *A National Climate Change Response Strategy for South Africa*. Pretoria, South Africa: Department of Environmental Affairs and Tourism.
- DEAT (20-10-2005). *Action for Climate Change Conference Statement*. Pretoria, South Africa: Department of Environmental Affairs and Tourism.
- DME (1998). *White Paper on the Energy Policy of the Republic of South Africa*. Pretoria, South Africa: Department of Minerals and Energy.
- DME (2003a). *Integrated Energy Plan for the Pretoria Republic of South Africa*. South Africa: Department of Minerals and Energy.
- DME (2003b). *White Paper on Renewable Energy*. Pretoria, South Africa: Department of Minerals and Energy.
- DME (2005). *Energy Efficiency Strategy of the Republic of South Africa*. Pretoria, South Africa: Department of Minerals and Energy.

- Ecofys (2007). *WWF Climate Scorecards Comparison of the climate performance of the G8 countries*. Includes background information for China, Brazil, India, Mexico, and South Africa. Prepared by Ecofys Germany/Netherlands for WWF.
- Erda, L., Yinlong, X., Shaohong, W., Hui, J. & Shiming, M. (2007). China's National Assessment Report on Climate Change (II): Climate change impacts and adaptation. *Advances in Climate Change Research*, 3 (Suppl.), 6-11.
- FCCC (1992). *United Nations Framework Convention on Climate Change*. Published by the UNEP/WMO Information Unit on Climate Change (IUCC), Geneva, Switzerland, Available at: <http://www.unfccc.int/resource/docs/convkp/conveng.pdf>.
- FCCC (2005). *TT: CLEAR, the technology information system of the FCCC*. <http://ttclear.unfccc.int/ttclear/jsp/>.
- Fenhann, J. (2008). *CDM Pipeline Overview* (1 May). Available at: <http://www.cdmpipeline.org/>.
- GoI (1992). *Eighth Five Year Plan, 1992-97*. Volumes, I and II, Planning Commission, New Delhi.
- GoI (2001). *Blueprint for power sector development*. New Delhi, Ministry of Power, Government of India.
- GoI (2002). *India and International Agreements, India Towards World Summit on Sustainable development*. <http://www.wssindia.org/agreement.html>, site visited in June.
- GoI (2004). *India's initial Communication to the United Nations Framework Convention on Climate Change*. Ministry of Environment and Forests, Government of India. Available at: [http://www.natcomindia.org/publication\\_ipcc.htm](http://www.natcomindia.org/publication_ipcc.htm).
- GoI (2004a). *Opportunities & Policy Challenges for Investment in India*. Background Paper. OECD India Investment Roundtable. New Delhi, Department of Industrial Policy and Promotion, Ministry of Commerce & Industry, Government of India.
- GoI (2004b). *Investment opportunities in infrastructure*. New Delhi, Department of Industrial Policy and Promotion, Ministry of Commerce & Industry, Government of India, Available at: <http://siadipp.nic.in/publicat/books/power.pdf>.
- Goldblatt, M. & Middleton, J. (2007). *Climate Policy Coherence and Institutional Coordination: Clarifying Institutional Responsibilities in South Africa*. BASIC paper 13. Available at: <http://www.basic-project.net/results.htm>.
- Golkany, I. (2007). *The Improving state of the World*, Washington, D.C.: Cato Institute Press.
- Gupta, J. (forthcoming) Global change: analyzing scale and scaling in Environmental Governance. In Young O, King, L. & Schroeder H (eds), *Institutions and environmental change: principal findings, applications and research frontiers*. Cambridge, MA: MIT Press.
- Gupta, J. (1995). The Global Environment Facility in its North-South Context. *Environmental Politics*, 4(1), 19-43.
- Gupta, J. (1997). *The Climate Change Convention and Developing Countries - From Conflict to Consensus?* Environment and Policy Series, Dordrecht: Kluwer Academic Publishers.
- Gupta, J. (2001). India and Climate Change Policy: Between Diplomatic Defensiveness and Industrial Transformation. *Energy and Environment*, 12(2&3), 217-236.
- Gupta, J. (2004). India and Climate Change: The Challenge of Sustainable Development. In Grover, V. (ed.) *Climate Change: Five Years After Kyoto*. (pp. 309-332). New Delhi: Oxford and IBH Publishing.
- Gupta, J. (2007). De Rol van China en India in het Mondiale Klimaat Beleid, *Nederlands Juristenblad*, 45-46, 2888-2892.
- Gupta, J. (2007). The multi-level governance challenge of climate change, *Environmental Sciences*, 4(3), 131-137.



- Gupta, J., Leeuw, K. van der & Moel, H. de. (2007). Climate change: a 'glocal' problem requiring 'glocal' action. *Environmental Sciences*, 4, 139-148.
- Gupta, J., Asselt, H. van, Kuik, O. & Evans, C. (2007). Exogenous promotion of sustainable electricity options in India: Opportunities and Challenges, *Energy and Environment*, 18(3&4), 403-420.
- Gupta, J., Lasage, R. & Stam, T. (2007). National Efforts to Enhance Local Climate Policy in the Netherlands, Special Issue of *Environmental Sciences*, 4(3), 171-182.
- Gupta, J., Vlasblom, J. & Kroeze, C. (Eds.) with contributions from Blok, K., Hisschemoller, M. Boudri, C. & Dorland, K. (2001). *An Asian Dilemma: Modernising the electricity sector in China and India in the context of rapid economic growth and the concern for climate change*. NOP report no. 410200097, NOP, RIVM, Bilthoven, The Netherlands.
- Halsnæs, K., Shukla, P.R. & Garg, A. (2008). Sustainable Development and Climate Change: Lessons from Country Studies. *Climate Policy*, 8(2), 202-219.
- Heggelund, G. (2007). China's Climate Change Policy: Domestic and International Developments. *Asian Perspective*, 31(2), 155-191.
- Henry, L.A. & McIntosh Sundstrom, L. (2007). Russia and the Kyoto Protocol: Seeking an Alignment of Interests and Image. *Global Environmental Politics*, 7(4), 47-69.
- Höhne, N., Philipsen, D. & Moltmann, S. (2007). *Factors underpinning future action: 2007 update*. Ecofys. For the Department for Environment Food and Rural Affairs (DEFRA), United Kingdom.
- IEA (2002). *Electricity in India. Providing power to the millions*. International Energy Agency/Organisation for Economic Cooperation and Development, Paris, France.
- IEA (2007). *IEA Energy Statistics*. Paris: International Energy Agency. Available at: <http://www.iea.org/statist/index.htm>.
- IISD (2006a). *Earth Negotiations Bulletin*, 12(300). Available at: <http://www.iisd.ca/download/pdf/enb12300e.pdf>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2006b). *Earth Negotiations Bulletin*, 12(309). Available at: <http://www.iisd.ca/download/pdf/enb12309e.pdf>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2006c). *Earth Negotiations Bulletin*, 12(318). Available at: <http://www.iisd.ca/download/pdf/enb12318e.pdf>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2007a). *Earth Negotiations Bulletin*, 12(233). Available at: <http://www.iisd.ca/download/pdf/enb12352e.pdf>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2007a) *Earth Negotiations Bulletin. COP/MOP*, 2(12), 344. Available at: <http://www.iisd.ca/climate/cop13/> Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2007b). *Earth Negotiations Bulletin*, 12(352). Available at: <http://www.iisd.ca/download/pdf/enb12352e.pdf>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2008). *Earth Negotiations Bulletin*, 12(362). Available at: <http://www.iisd.ca/download/pdf/enb12362e.pdf>. Winnipeg, Canada: International Institute for Sustainable Development.

- IISD (2008a). *Earth Negotiation Bulletin*, 12(355).. Available at:  
<http://www.iisd.ca/vol12/enb12355e.html>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2008b). *Earth Negotiation Bulletin*, 12(359). Available at:  
<http://www.iisd.ca/vol12/enb12359e.html>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2008c). *Earth Negotiation Bulletin*, 12(361).. Available at:  
<http://www.iisd.ca/vol12/enb12361e.html>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2008d). *Earth Negotiations Bulletin*, 12(362). Available at:  
<http://www.iisd.ca/download/pdf/enb12362e.pdf>. Winnipeg, Canada: International Institute for Sustainable Development.
- IISD (2008e). *Earth Negotiation Bulletin*, 12(363). Available at:  
<http://www.iisd.ca/vol12/enb12363e.html>. Winnipeg, Canada: International Institute for Sustainable Development.
- ILO (2008). *Mexico Key socioeconomic indicators*. Available at:  
<http://www.ilo.org/public/english/region/ampro/cinterfor/ifp/mex/index.htm>.
- INE-SEMARNAT (2006). *Tercera Comunicación Nacional ante la Convención Marco de las Naciones Unidas sobre el Cambio Climático*. Instituto Nacional de Ecología, Secretaría de Medio Ambiente y Recursos Naturales, Mexico.
- INPE (2007). Sistema de Detecção do Desmatamento em Tempo Real (DETER). Database. São José dos Campos: INPE.
- International Energy Agency (IEA) (2007). *IEA Energy Statistics*. Paris: International Energy Agency. Available at: <http://www.iea.org/Textbase/country/index.asp>.
- Interviews (2005). *Manuscript of stakeholder interviews, available with authors*.
- Institute for Global Environmental Strategies (IGES) (2005). *Asian Perspectives on Climate Regime Beyond 2012: Concerns, Interests and Priorities*. Available at:  
<http://www.iges.or.jp/en/cp/report13.html>.
- IPS (Latin America) (24-5-2007). *Mexico's biological diversity in danger; Biodiversity-Mexico: Sierra Gorda Reserve Hit Hard by Climate Change*.
- Japan Economic Newswire (2007). Japan, Mexico agree to start 2-way climate change talks. *Japan Economic Newswire*, November 25.
- Jeon, H.K. & Yoon S.S. (2006). From International Linkages to Internal Divisions in China: The Political Response to Climate Change Negotiations. *Asian Survey*, 46(6), 846-866.
- Joint Position Paper (8-6-2007). *Joint Position Paper of Brazil, China, India, Mexico and South Africa participating in the G8 Heiligendamm Summit*. Available at:  
<http://www.indianembassy.de/news/pmvisit4.htm>.
- Jung, M. (2006). Host Country Attractiveness for CDM Non-Sink Projects. *Energy Policy*, 34(15), 2173-2184.
- Kim, J.A. (2003). *Sustainable Development and the CDM: A South African Case Study*. Tyndall Centre for Climate Change Research Working Paper 42. Available at:  
[http://www.tyndall.ac.uk/publications/working\\_papers/working\\_papers.shtml](http://www.tyndall.ac.uk/publications/working_papers/working_papers.shtml).
- Koch, I.C., Vogel, C. & Patel, Z. (2007). Institutional Dynamics and Climate Change Adaptation in South Africa. *Mitigation and Adaptation Strategies for Global Change*, 12, 1323-1339.
- Korppoo, A. & Moe, A. (2007). *Russian Climate Politics: Light at the End of the Tunnel?* Briefing Paper. Climate Strategies. The Fridtjof Nansen Institute: Lysaker, Norway.

- Kroeze, C., Vlasblom, J., Gupta, J., Boudri, C. & Blok, K. (2004). The Power Sector in China and India: Greenhouse Gas Emission Reduction Potential and Scenarios for 1990-2020. *Energy Policy*, 32, 55-76.
- La Rovere, E. (2002). *Climate Change and Sustainable Development Strategies: A Brazilian Perspective*. Paris: OECD.
- Lewis, J.I. (2007). China's Strategic Priorities in International Climate Change Negotiations. *The Washington Quarterly*, 31(1), 155-174.
- Li, J. (2007). Mitigation Country Study – China. *Human Development Report 2007/2008*. Occasional Paper 32. New York: United Nations Development Programme.
- Machado, L.A.F. (2007). *Informal Thematic Debate "Climate Change as a Global Challenge". Speech delivered by the Brazilian Delegation*. Available at [http://www.brazil.org.uk/environment/index\\_assets/brazilclimatechange.pdf](http://www.brazil.org.uk/environment/index_assets/brazilclimatechange.pdf).
- Marengo, J.A. (2007). *Mudanças climáticas globais e seus efeitos sobre a biodiversidade: caracterização do clima atual e definição das alterações climáticas para o território brasileiro ao longo do século XXI*. Brasília: MMA.
- Magrin, G., Gay García, C., Cruz Choque, D., Giménez, J.C., Moreno, A.R., Nagy, G.J., Nobre, C. & Villamizar, A. (2007). Latin America. Climate Change 2007: Impacts, Adaptation and Vulnerability. In Parry, M.L., Canziani, O.F., Palutikof, J.P., Linden, P.J. van der & Hanson, C.E., (Eds.), *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. (pp. 581-615). Cambridge University Press, Cambridge, UK.
- Martinez, J. (2004). Workshop on the preparation of National Communications from non-Annex I Parties of the UNFCCC. *Presentation of Julia Martinez, General Directorate of Research on Urban, Regional and Global Pollution, INE-SEMARNAT*. Available at: [http://unfccc.int/files/meetings/workshops/other\\_meetings/application/vnd.ms-powerpoint/jm\\_mexico.ppt](http://unfccc.int/files/meetings/workshops/other_meetings/application/vnd.ms-powerpoint/jm_mexico.ppt).
- Mehling, M. (2007). Bridging the Transatlantic Divide: Legal Aspects of a Link Between Regional Carbon Markets in Europe and the United States. *Sustainable Development Law and Policy*, 7(2), 46-52.
- Murphy, D., Drexhage, J., Cosbery, A., Tirpak, D. & Egenhofer, C. (2008). *Furthering EU Objectives on Climate Change and Clean Energy. Building Partnerships with Major Developing Economies*. Winnipeg, Canada: International Institute for Sustainable Development.
- Mwakasonda, S. & Winkler, H. (2005). Carbon Capture and Storage in South Africa. In Bradley, R., Baumert, K. & Pershing, J. (Eds.), *Growing in the Greenhouse: Protecting the Climate by Putting Development First*. (pp. 95-109). Washington, D.C.: World Resources Institute.
- Mwandosya, M.J. (1999). *Survival Emissions: A Perspective from the South on Global Climate Change Negotiation*. DUP (1996) LIMITED and The Centre for Energy, Environment, Science and Technology (CEEST-2000), Tanzania.
- National Development and Reform Commission (NDRC) (2007). *China's National Climate Change Program*. Prepared under the Auspices of National Development and Reform Commission People's Republic of China. Available at: [www.ccchina.gov.cn/WebSite/CCChina/UpFile/File188.pdf](http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/File188.pdf).
- Neeff, T., Ecosecurities Ltd. (2008), email communication, on file with author.
- Netherlands Environmental Assessment Agency (MNP) (2006). *'From Climate Objectives to Emissions Reductions.'* MNP. Bilthoven, The Netherlands.
- Netherlands Environmental Assessment Agency (MNP) (2007). *China Now No. 1 in CO2 Emissions; USA in Second Position*. Available at:

- <http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAnsecondposition.html>.
- NIFC (2008). *National Interagency Fire Center*. Boise, Idaho. Available at: <http://www.nifc.gov/>.
- Paredis, E., Goeminne, G., Maes, F. & Lambrecht, J. (2006). *Equity and Sustainable Development in a Post-2012 Climate Regime: Interests and Concerns of Developing Countries*. Ghent, Belgium: Ghent University.
- Noordwijk Conference Report*, 22, 73-74 (1990). Noordwijk, The Netherlands.
- Perelet, R., Pegov, S. & Yulkin, M. (2007). Climate Change. Russia Country Paper. *Human Development Report 2007/2008*. Occasional Paper 2007/12. New York: United Nations Development Programme.
- Perkins, R. (2005). Electricity sector restructuring in India: An environmentally beneficial policy? *Energy Policy*, 33(4), 439-449.
- Presidencia (31-7-2007a). *Message from President Calderón at the End of the Private Meeting he Held with Mr. Albert Gore, Former Vice-President of the United States of America*. Available at: <http://www.presidencia.gob.mx/en/press/?contenido=31224>.
- Presidencia (25-5-2007b). *President Calderon at National Climate Change Strategy*. Available at: <http://www.presidencia.gob.mx/en/press/?contenido=30333>.
- Presidencia (12-10-2007c). *President Calderón Congratulates Al Gore and UN's ICCP on Nobel Peace Prize*. Available at: <http://www.presidencia.gob.mx/en/press/?contenido=32177>.
- Presidencia (8-6-2007d). *President Calderón's Intervention at Group of 8 Summit*. Available at: <http://www.presidencia.gob.mx/en/press/?contenido=30551>.
- Presidencia (29-1-2007e). *President Calderon at Sustainable Development and Climate Change Meeting*. Available at: <http://www.presidencia.gob.mx/en/press/?contenido=28829>.
- Prime Minister (7-2-2008). Speech, Available at: <http://www.pmindia.nic.in>.
- Point Carbon (2005). *CDM & JI Monitor*, 8 February. Available at: [http://www.pointcarbon.com/wimages/CJM\\_08\\_02\\_2005\\_1.pdf](http://www.pointcarbon.com/wimages/CJM_08_02_2005_1.pdf) (registration required).
- Pulver, S. (2006). Climate politics in Mexico in a North American perspective. In Selin, H. & Vendeveen, S.D. (Ed), *Climate Change Politics in North America: The State of Play*. (pp. 49-60). Woodrow Wilson International Center for Scholars, Canada Institute.
- Rajsekhar, B., Hulle, F.V. & Jansen, J.C. (1999). Indian Wind Energy Programme: Performance and Future Directions. *Energy Policy*, 27(11), 669-678.
- Rodi, M., et.al. (2006). Implementing the Kyoto Protocol in a Multidimensional Legal System: Lessons from a Comparative Assessment. *Yearbook of International Environmental Law*, 16, 3-79.
- Rosenberg, S. (2007). A "Prompt Start" for the CDM? *Lessons from Early Experiences from South Africa*. BASIC paper 11. Available at: <http://www.basic-project.net/results.htm>.
- RSA (2000). *Initial National Communication under the United Nations Framework Convention on Climate Change*. Pretoria: Republic of South Africa.
- Ruoen, R. & Kai, C. (1995). *China's GDP in U.S. Dollars Based on Purchasing Power Parity*. Policy Research Working Paper 1415. World Bank, Washington, D.C.
- Shukla, P.R., Kapshe, M. & Garg, A. (2004). *Development and Climate: Impacts and Adaptation for Infrastructure Assets in India*. ENV/EPOC/GS/FD/RD(2004)3/FINAL, OECD, Paris.
- Sindico, F. & Gupta, J. (2004). Moving the climate change regime further through a Hydrogen Protocol. *Review of European Community and International Environmental Law*, 13(2), 175-186.

- Srivastava, L., Gupta, J. et al. (2007). *Modernising the Indian Electricity Sector*, The Energy Research Institute Publications, New Delhi.
- States News Service. (2008). New partnership strategy Mexico-World Bank. *States News Service*, April 8.
- Tangen, K., Korppoo, A., Berdin, V., Sugiyama, T., Egenhofer, C., Drexhage, J., Pluzhnikov, O., Grubb, M., Legge, T., Moe, A., Stern, J. & Yamaguchi, K. (2002). *A Russian Green Investment Scheme. Securing environmental benefits from international emissions trading*. Climate Strategies. Available at <http://www.climate-strategies.org>.
- Tearfund (2006). Ids. Tearfund Climate Change Briefing Paper 1. *Overcoming the barriers. Mainstreaming climate change adaptation in developing countries*. Available at: <http://www.tearfund.org/webdocs/website/Campaigning/Policy%20and%20research/Overcoming%20the%20barriers%20briefing%20paper.pdf>.
- Thakur, T., Deshmukh, S.G., Kaushik, S.C. & Kulshrestha, M. (2005). Impact assessment of the Electricity Act 2003 on the Indian power sector. *Energy Policy*, 33(9), 1187-1198.
- The Guardian (2007). Brazil rejects Bush move on climate change talks. *The Guardian*, 4 June. Available at <http://www.guardian.co.uk/world/2007/jun/04/brazil.usa>.
- The Lancet (2008). Is climate change affecting dengue in the Americas? *The Lancet*, March 22.
- UNCED (3/14-6-1992). *Rio Declaration and Agenda 21*. Report on the UN Conference on Environment and Development, Rio de Janeiro, UN doc. A/CONF.151/26/Rev.1 (Vols.1-III).
- UNDP (2007). *Human Development Report 2007/2008. Fighting Climate Change: Human Solidarity in a Divided World*. New York: United Nations Development Programme.
- UNFCCC (2004). *Report on the in-depth review of the third national communication of the Russian Federation*. FCCC/IDR.3/RUS. Available at <http://unfccc.int>
- UNFCCC (16-5-2005a). *Statement by Brazil*. Bonn, Germany: Seminar of Governmental Experts. Available at [https://unfccc.int/files/meetings/seminar/application/pdf/sem\\_pre\\_brazil.pdf](https://unfccc.int/files/meetings/seminar/application/pdf/sem_pre_brazil.pdf).
- UNFCCC (17-5-2005b). *ABSTRACT: Climate Change: A perspective from Mexico*. Dr. F. Tudela, Underminister for Planning and Environmental Policy, SEMARNAT. Bonn, Germany: Seminar of Government Experts.
- UNFCCC (2006a). *Dialogue Working Paper 21. Submission from Brazil*. Available at [http://unfccc.int/files/meetings/dialogue/application/pdf/wp\\_21\\_braz.pdf](http://unfccc.int/files/meetings/dialogue/application/pdf/wp_21_braz.pdf).
- UNFCCC (13-4-2006b). *Dialogue Working Paper 5. Submission from South Africa*. Available at <http://unfccc.int>.
- UNFCCC (20-10-2006c). *Dialogue Working Paper 18. Submission from South Africa*. Available at <http://unfccc.int>.
- UNFCCC (21-3-2007a). *Information and views on the mitigation potential at the disposal of Annex I Parties. Submission by South Africa*. FCCC/KP/AWG/2007/MISC.1. Available at <http://unfccc.int>.
- UNFCCC (27-4-2007b). *Relevant Programmes, Activities and Views on the Issues Relating to Climate Related Risks and Extreme Events. Submission by South Africa*. FCCC/SBSTA/2007/MISC.4. Available at <http://unfccc.int>.
- UNFCCC (19-11-2007c). *Report on the Dialogue on Long-term Cooperative Action to Address Climate Change by Enhancing Implementation of the Convention*. FCCC/CP/2007/4/Add.1. Available at <http://unfccc.int>.
- UNFCCC (2-3-2007d). *Views on the Range of Topics and Other Relevant Information Relating to Reducing Emissions from Deforestation in Developing Countries. Submission by South Africa*. FCCC/SBSTA/2007/MISC.2. Available at <http://unfccc.int>.

- UNFCCC (2007e). *Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries*. Available at: [http://unfccc.int/files/essential\\_background/background\\_publications\\_htmlpdf/application/txt/pub\\_07\\_impacts.pdf](http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/txt/pub_07_impacts.pdf).
- UNFCCC (7-8-2007f). *Workshop on the proposal of the Russian Federation to develop appropriate procedures for the approval of voluntary commitments*. Report by the Chair of the Workshop. FCCC/KP/CMP/2007/INF.2. Available at <http://unfccc.int>.
- UNFCCC (12-3-2008). *Views regarding the work programme of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention*. FCCC/AWGLCA/2008/MISC.1/Add.1. Available at <http://unfccc.int>.
- UNIDO (2003). *CDM Investor Guide Brazil*. Available at: [http://www.unido.org/fileadmin/media/documents/pdf/Energy\\_Environment/CDM\\_guide\\_brazil.pdf](http://www.unido.org/fileadmin/media/documents/pdf/Energy_Environment/CDM_guide_brazil.pdf).
- USDS (2002). *U.S. Climate Action Report 2002*. Washington, D.C. USDS, United States Department of State. Available at: [www.state.gov/g/oes/climate/](http://www.state.gov/g/oes/climate/).
- Vargas, E. (27-9-2007). *Major Economies Meeting on Climate Change and energy Security. Washington*. Speech by Ambassador Everton Vargas.
- Vellinga, P., Kendall, P. & Gupta, J. (eds.) (1990). *Noordwijk Conference Report*, Volume II, Ministry of Housing, Physical Planning and Environment, the Hague.
- Viola, E. (2008). *The Evolving Role of Brazil in the Global Politics of Climate, 1996-2008*. Paper presented at the 2008 Annual Convention of the International Studies Association. Available at [http://www.allacademic.com/meta/p251032\\_index.html](http://www.allacademic.com/meta/p251032_index.html).
- Volpi, G. (2007). *Climate Mitigation, Deforestation and Human Development in Brazil*. Geneva: Human Development Report Office
- White House (16-4-2008). [www.whitehouse.gov](http://www.whitehouse.gov), "President Bush Discusses Climate Change". 2008.
- Winkler, H. & Marquard, A. (2007). *Energy Development and Climate Change: Decarbonising Growth in South Africa*. Occasional paper for the Human Development Report 2007/2008. Cape Town, South Africa: Energy Research Centre, University of Cape Town.
- Winkler, H. (2005). Renewable Energy Policy in South Africa: Policy Options for Renewable Electricity. *Energy Policy*, 33(1), 27-38.
- Winkler, H. (Ed.) (2006). *Energy Policies for Sustainable Development in South Africa: Options for the Future*. Cape Town, South Africa: Energy Research Centre, University of Cape Town.
- Winkler, H., Höhne, N. & Elzen, M. den (2008). Methods for Quantifying the Benefits of Sustainable Development Policies and Measures (SD-PAMs). *Climate Policy*, 8(2), 119-134.
- Winkler, H., Howells, M. & Baumert, K. (2007). Sustainable Development Policies and Measures: Institutional Issues and Electrical Efficiency in South Africa. *Climate Policy*, 7, 212-229.
- Winkler, H., Spalding-Fecher, R., Mwakasonda, S. & Davidson, O. (2002). Sustainable Development Policies and Measures: Starting from Development to Tackle Climate Change. In Baumert, K., Blanchard, O., Llosa, L. & Perkaus, J.F. (Eds.), *Building on the Kyoto Protocol: Options for Protecting the Climate*. (pp. 61-87). Washington, D.C.: World Resources Institute.
- World Bank (2007). *World Development Indicators 2007*. Washington, D.C.: World Bank.
- World Bank. (2008). *Program Information Document (PID)*. Report No.: AB3676.
- WSJ (2007). China, U.S. Spar at Climate Talks. *Wall Street Journal*, Dec.

WSJ (2008). Why the UN's "Developed Countries Should Pay" Theory is Flawed. *Wall Street Journal*, 10 April.

Yergin, D. (1992). *The Prize: The Epic Quest for Oil, Money & Power*. Simon & Schuster, New York, NY.